JUNE, 1953

PRODUCTS finishing

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Finishes on Metal Products

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consulting and contributing editors

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advertising manager

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Products Finishing

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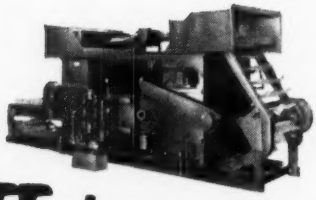

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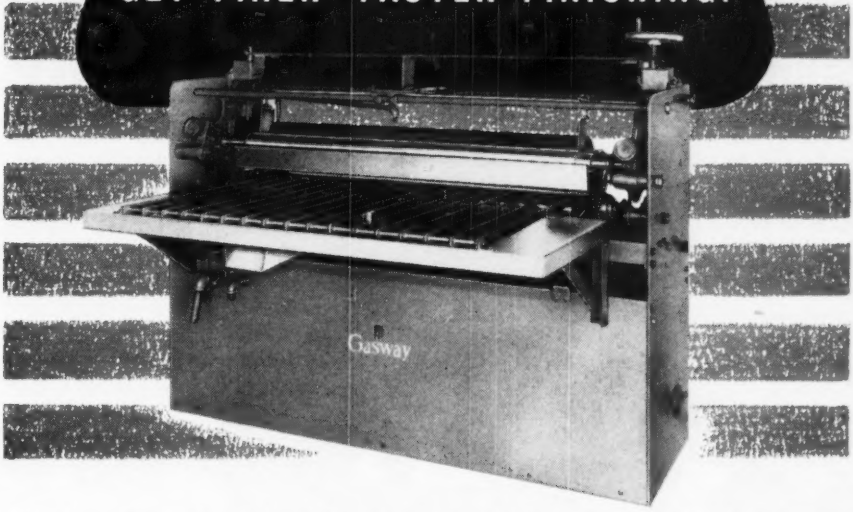

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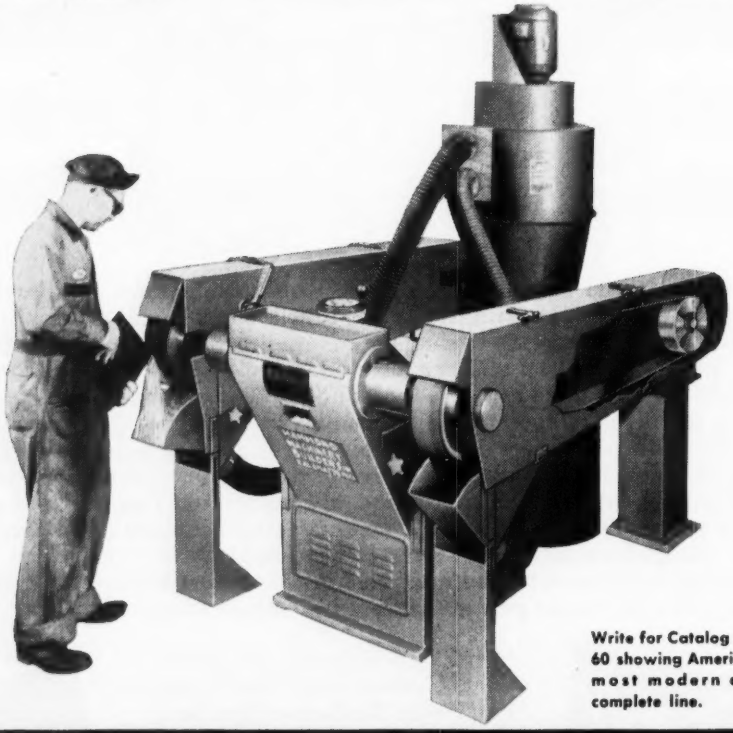

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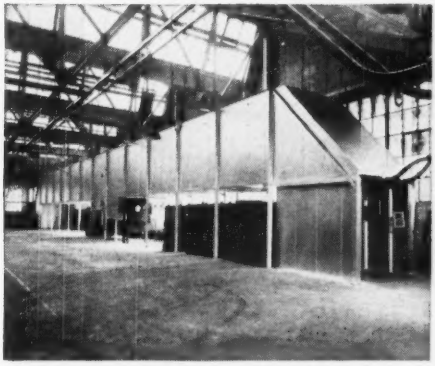

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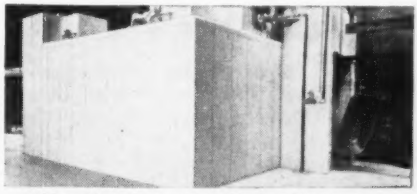

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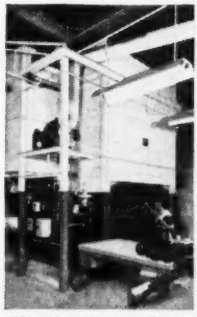

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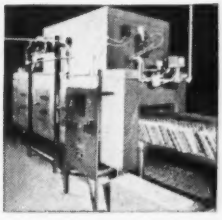

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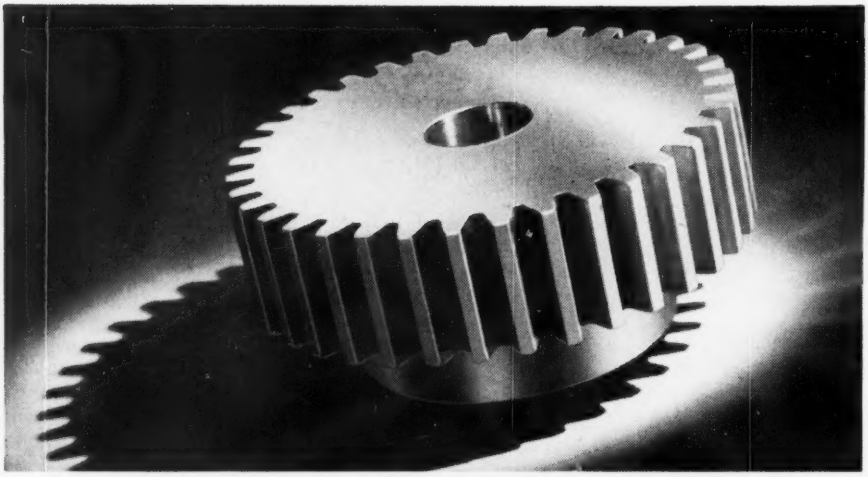

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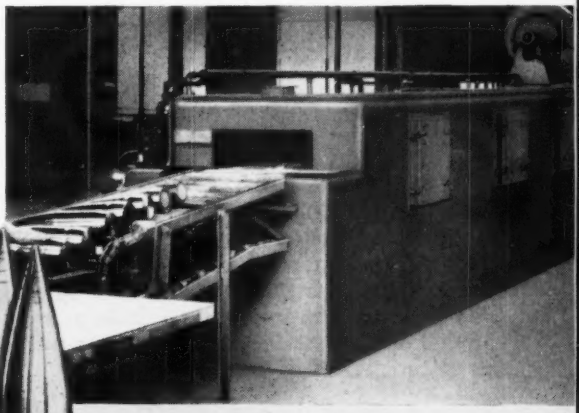

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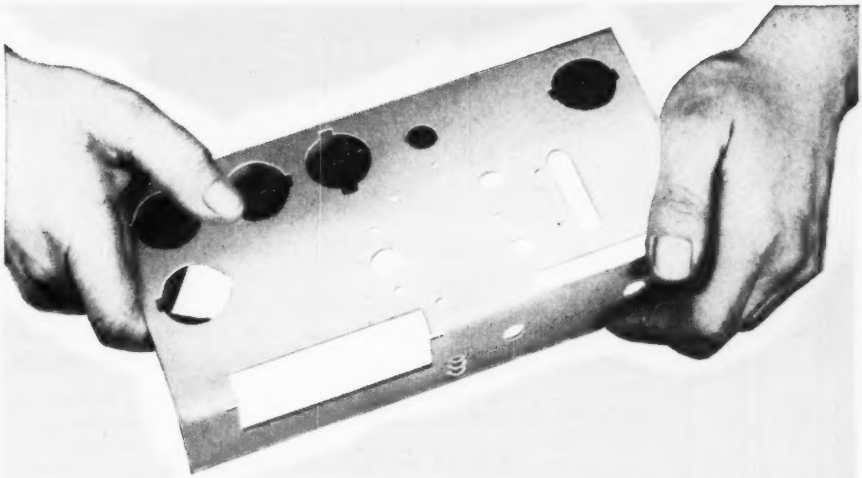

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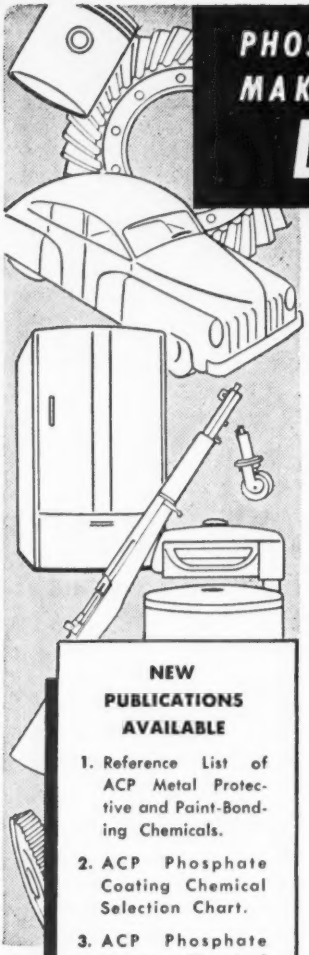

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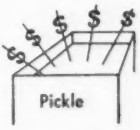

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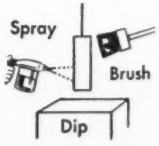

WITCH DIP #2—Here is what we believe is the most revolutionary finish ever applied over a plated or black-oxide finish. WITCH DIP #2 is a wax which dries hard, producing a lustrous, durable and highly corrosion-resistant finish. WITCH DIP #2 is available in a Gloss, Semi-Gloss or Dull finish.

Technical bulletins describing the merits of each of these products are available. Laboratory samples will be furnished on any of the above upon request.

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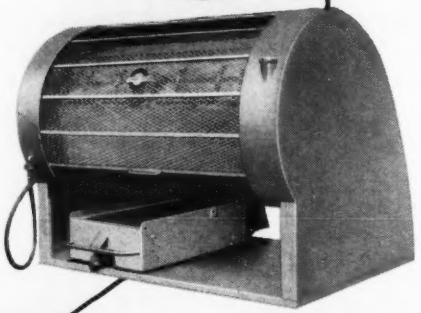
THE MITCHELL-BRADFORD CHEMICAL CO.
2446D Main St. Stratford, Conn.

QUALITY PRODUCTS OF CHEMICAL RESEARCH

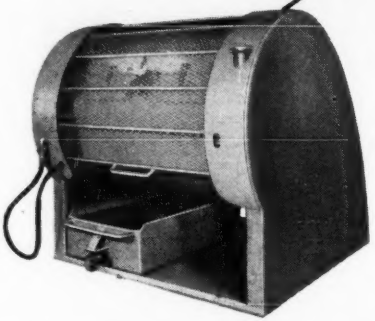
Visit us at Room 1241 — Benjamin Franklin Hotel

TUMBLE

Come to GRAV-I-FLO FINISH for ALL your tumbling needs!



Model 66″, two compartments



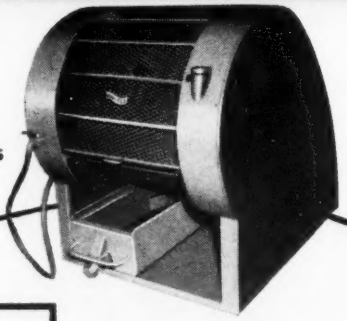
Model 48″, two compartments

You can get complete equipment and supplies for faster, better tumbling at Grav-i-Flo. This authoritative tumbling source can furnish you, from its years of experience, the correct answer to any tumbling problem.

Larger capacity machines take 31% to 80% more work-load in same floor space. Improved cutting materials shorten cutting cycle by 15% to 25%. Grav-i-Flo installations substantially reduce capital investment, floor space, and production time!

MACHINES

Grav-i-Flo 66″, 48″ and 36″ machines have cam locked doors with manually released safety stops; available with unlined or rubber lined cylinders, constant or variable speed drive, J.I.C. controls, and timers from 5 minute to 20 hour cycles. Equipped with electric wiring and water piping installed ready for plant hook up.



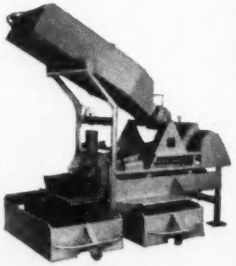
Model 36″,
two compartments

Model 24″,
two compartments

Designed For Small Lot Production and Laboratory Processing.

ACCESSORIES

Two deck parts-and-chips separator and chip grader



Occupies less floor space. Separates parts quickly without impingements. Grades 3 sizes of chips simultaneously.

Other Grav-i-Flo accessories include tubular yoke hoist pans, chip pans, wash-out doors, screens, chip bins, unloading boots, dip tanks.

Chips and compounds

Grav-i-Flo natural and synthetic deburring and finishing chips and highly developed compounds consistently outperform every type of tumbling process offered on the market.

Investigate!

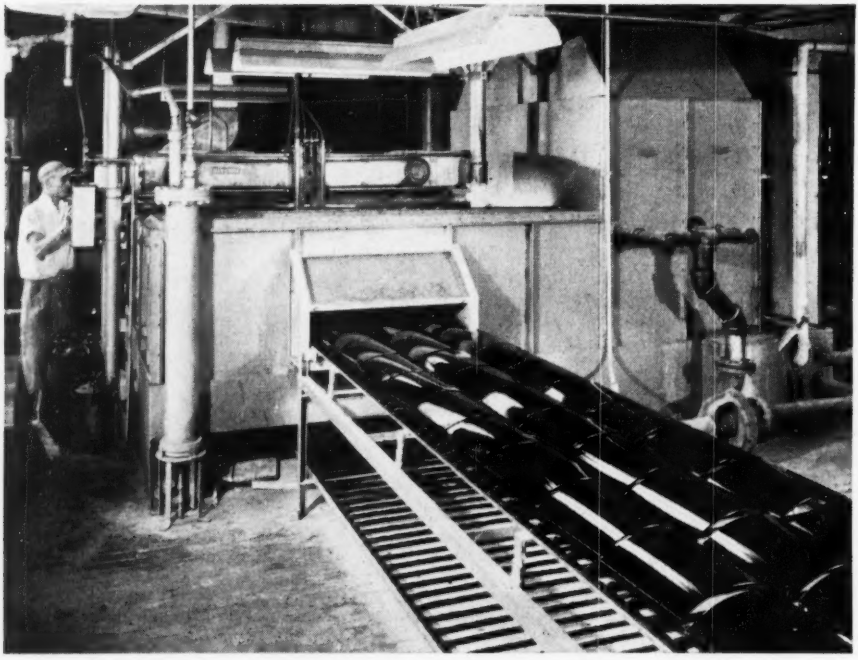
Grav-i-Flo superiority in equipment and supplies has been proved to hundreds of users in many different industries. Let us show you, too, at no obligation. Our representative will visit your plant, or send samples direct to us. Engineering Service available to all users.

SEND FOR CATALOG showing complete line of Grav-i-Flo equipment, accessories and supplies.

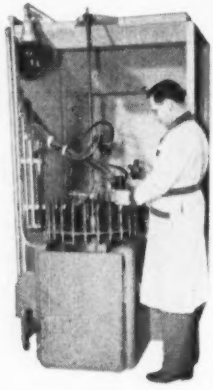
THE GRAV-I-FLO CORPORATION

Dept. PF6, 400 Norwood Avenue
STURGIS, MICHIGAN

DeVilbiss automatic equipment

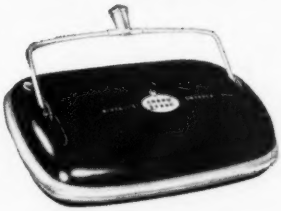


Bissell Carpet Sweeper Company applies sales appeal to 1200 metal tops for carpet sweepers per hour with a DeVilbiss automatic horizontal transverse machine. It saves coating material, reduces scrap loss, gives a better looking job.



This DeVilbiss rotary-type machine is ideal for finishing a wide range of small, symmetrical parts. Available with 24"- or 36"-diameter table, 12 to 36 spindles; handles 660 to 5400 pieces per hour depending on job conditions.

cuts paint costs 2/3 at Bissell!



Three men now handle the work of nine. And rejects are negligible since Bissell put in DeVilbiss automatic spray-painting equipment.

Production requirements at Bissell Carpet Sweeper Company, Grand Rapids, Michigan, call for 1200 painted metal tops per hour for carpet sweepers.

Before Bissell installed a DeVilbiss automatic horizontal transverse machine, the job was handled manually in three booths. Nine workers were needed to keep up production—rejects ran 10%. Now, with the machine, only three men are required to meet production requirements *and the percentage of rejects is so low that Bissell doesn't keep records on them any more!*

How about *your* company? Is there a job out in the shop that could benefit from the high speed, the smooth and uniform finishes brought by DeVilbiss automatic spray-painting equipment? Whether you're working with flat parts, parts traveling on overhead conveyors or parts that require both inner and outer coatings, you'll find DeVilbiss has a wide variety of machines to serve you.

Your local DeVilbiss representative can give you full details on DeVilbiss automatic spray-painting equipment as well as DeVilbiss spray guns, air compressors, hose and connections. Why not make a note to call him while it's still fresh in your mind?

THE DEVILBISS COMPANY
Toledo, Ohio

Windsor, Ontario • London, England
Santa Clara, Calif.

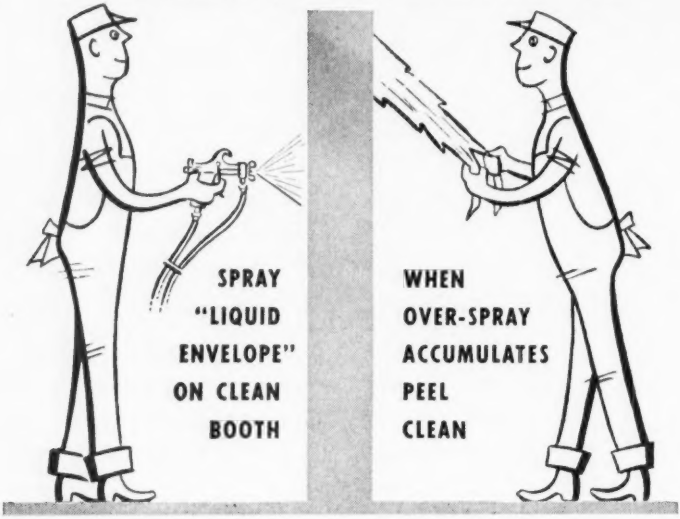
FOR BETTER SERVICE, BUY
DEVILBISS

BRANCH OFFICES AND DISTRIBUTORS IN PRINCIPAL CITIES THROUGHOUT THE UNITED STATES, CANADA AND THE WORLD

easy way to keep booths clean

"LIQUID ENVELOPE"

STRIPPABLE PROTECTIVE PLASTIC FILM



That's all there is to the simple, labor-saving, inexpensive "Liquid Envelope" way to keep booths firesafe, better illuminated, better ventilated. Costs far less than the outmoded hand-scraping or grease-papering methods. ***New Users:*** Order a 5 gallon Test-Sample at the drum-lot price. Hundreds of steady users found out that way. Why not you?

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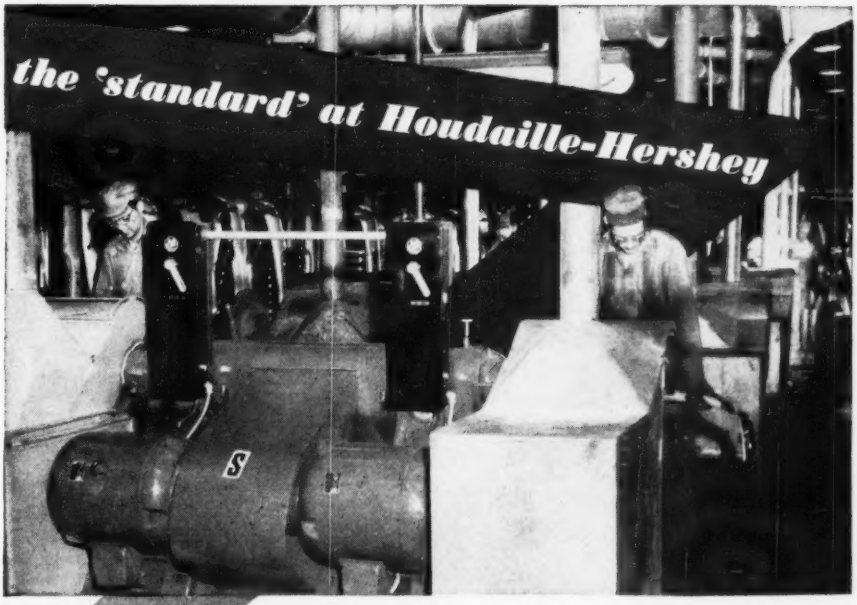
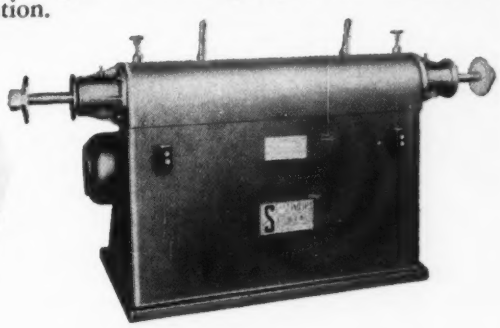


Over 50 Standard Type MB2 High Speed Buffers complete the picture of high production polishing and buffing at the Huntington, W. Va. division of the Houdaille-Hershey Corporation.

These Standard MB2 Buffers are equipped with twin motors driving two independent spindles through 3 ball bearings per spindle. Each motor has its own magnetic starter, push button station, shaft lock, multiple V-belt drive and belt tension adjustment. Standard MB2 Buffers are available in sizes ranging from two (2) 3 HP to two (2) 30 HP motors with speeds to your specifications. *Write for Catalogue 44.*



Here are results you can count on:

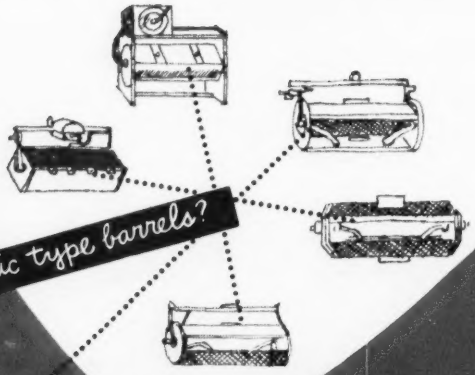
- Higher Production
- Minimum Maintenance
- Longer Wheel Life
- Maximum Economy
- Faster Polishing Operation

Standardize with

the STANDARD electrical tool co.

MACHINE TOOLS

2518 RIVER ROAD • CINCINNATI 4, • OHIO



using plastic type barrels?

then insist upon

Cowles HS cleaner

HS is a heavy duty cleaner of medium alkalinity, particularly effective in plastic-type barrel cleaning operations where high detergency is required at relatively low temperatures. This anhydrous, silicated cleaner gives maximum cleaner life, produces no undesirable scums in the acid or rinse tanks, and rinses off quickly and completely. Cowles HS is especially formulated to handle extraordinary heavy soil loads in barrel lines or other soak tank operations, including removal of large amounts of oil.

We will be glad to send you complete information.

prompt shipments from convenient warehouse stocks

COWLES TECHNICAL SERVICE **gladly furnished upon request**

COWLES CHEMICAL COMPANY

METAL CLEANER DEPARTMENT

7016 EUCLID AVENUE * CLEVELAND 3, OHIO

Pf editorial

JUNE, 1953

Vol. 17, No. 9

Dividends From Technical Societies

The establishment, growth, and development of the technical society or association in every field of science, business, and industry has become a familiar element of the American scene. Such societies are usually organized into local or regional branches to make regular, frequent meetings feasible, and the local groups are combined into a national organization which is a governing and policy making body. The national body usually supervises or produces a technical publication distributed to all members and to other interested individuals. Information of interest to the society's members and to the industry in question is disseminated at local meetings, in the official journal of the society, and at national conventions.

It seems reasonable to ask the question, "Who benefits from all this activity?"

Obviously, the technical society member benefits by acquiring additional technical and scientific knowledge — by keeping up-to-date — in his field of interest. In addition, by his work in local and national groups, he broadens his own field of vision and develops new skills and abilities. Most societies admit associate members — those not actively engaged in a particular industry, but associated with it. For such members the society is a training school, increasing the member's general knowledge of the field so that he can become more useful in his own activity.

Technical societies assist employers or company executives in determining the more promising members of the organization. An individual interested enough in his own progress to become active in a technical or scientific organization thus demonstrates that he should be considered for greater responsibilities, or that he has added capacity which can be valuable to his employer.

Progressive managements support technical societies because it is realized that employee members bring to the daily job a much greater knowledge of and interest in the industry in question.

The nation as a whole benefits from the activities of technical societies. Such groups have performed the function of bringing together men with common interests so that knowledge could be exchanged, research promoted, and duplication of effort avoided. The sum total of this has meant that industry as a whole has moved forward at an accelerated pace. Although, even today, there are still some instances of secrecy regarding industrial developments, still there is such an overwhelming amount of "shared" knowledge that each industry, and correspondingly, each individual in the nation, benefits tremendously.

Support, with pride, your technical society! It has helped the nation to grow.

Ezra A. Blount

—EDITOR

40th

ANNUAL A.E.S. CONVENTION
PHILADELPHIA JUNE 15-18

BENJAMIN FRANKLIN HOTEL

THE Philadelphia Branch, an organization of electroplaters since 1910, assisted by two of the A.E.S. branches which it helped to form—the Lancaster and Allentown-Reading Branches—has planned an outstanding convention for A.E.S. members and guests. The General Program, page 40, lists the events in chronological sequence.

The technical sessions, planned to conform with the theme "What is New in the Plating Field," should prove valuable to all for the information, both specific and general, thus offered. For details of the sessions, see page 62.

Realizing the importance of entertaining the ladies in grand style, the Committee has scheduled a week of interesting activities, details of which appear on page 48.

The Metal Finishing Suppliers' Association is again sponsoring the MFSA Open House and Supper Dance on Monday evening, June 15, and the MFSA Golf Outing on Tuesday afternoon. For details of the Golf Outing, see page 61.

The Benjamin Franklin Hotel, convention headquarters, is located in the heart of historic Philadelphia, and many points of general and historic interest are located within easy walking distance from the hotel. Among these are: Declaration Chamber, where the Declaration of Independence was adopted; Liberty Bell; Independence Hall; Betsy Ross House; Congress Hall; Carpenters' Hall; Franklin Institute; Philadelphia Museum of Art; Zoological Garden.

Samuel Heiman
General Chairman

Welcome to Philadelphia

Fellow Members and Guests:

You have come to the Philadelphia Convention from far and near at considerable expense and sacrifice of time.

Your decision was based, in many cases, on experience with past memorable conventions in which you were rewarded by increasing your technical knowledge from the papers and discussions, by meeting old friends and making new ones and by enjoying yourselves in the many social functions, all characterized by relaxing and congeniality.

To meet this objective, your Philadelphia Convention Committee has worked over a period of many months planning and arranging the activities given in this program.

Many people will participate and help us in carrying out the many features planned. These include the authors and chairmen of the Educational Sessions, A. E. S. officials, volunteers from the Philadelphia, Allentown-Reading and Lancaster Branches and many others.

We hope that you will actively participate in the various activities and make this Convention your own. We hope your stay will be both profitable and enjoyable.

Welcome to the Philadelphia Convention and to Philadelphia, the birthplace of our Country and "The Workshop of the World".

Philadelphia Convention Committee

Samuel Heiman
General Chairman

Welcome Ladies:

Mary F. Robson

It has been twenty-one long years since we have had the pleasure of welcoming our old A. E. S. friends to Philadelphia, and we are very happy that in the intervening years we have acquired so many new ones.

In all sincerity, we have anticipated these four days as much as we hope you have and have truly enjoyed planning for your entertainment and comfort.

Philadelphia enshrines and treasures its historic past, but the city is proud of the progressiveness that made it the birthplace of the republic and the city of brotherly love. We are justly proud to have all of you here to enjoy all it offers to visitors. Our main objective is that you will remember these few days and be pleased that you came.

Again a most hearty and sincere welcome to the Philadelphia Convention!

The Ladies' Committee

Mary F. Robson
Chairman

Edwin F. Ottens

As in previous conventions, an exhibit of Plated Ware is featured. Branches and individual members have expended considerable time and effort to provide educational displays of various plating methods and techniques.

Prizes to individual members and Branches will be awarded for the best displays. A visit to the Plated Ware Exhibits in the Lafayette Room will be well worthwhile.

Branch Exhibits Committee

Edwin F. Ottens
Chairman

A. E. S. Convention Committees

General Chairman—Samuel Heiman; **Co-Chairman**—Delmar R. Robson.

Advisory—Hiram S. Lukens, A. Kenneth Graham.

Ladies' Committee—Mrs. D. R. Robson, Chairman, Mrs. C. E. Boerckel, Mrs. F. Fulforth, Mrs. S. Heiman, Mrs. E. R. Lanahan, Mrs. G. M. Long, Mrs. I. W. Marcovitch, Mrs. E. F. Ottens, Mrs. A. H. Pope, Mrs. W. A. Reynolds, Mrs. A. G. Snow.

Banquet—Clarence E. Boerckel.

Publicity—Alfred H. Pope.

Entertainment—Nat Verrelle.

Finance—George M. Long.

Hotel—Thomas M. Rodgers

Lancaster Branch—Harry L. Hovis.

Allentown-Reading Branch — Norman H. Miller.

Educational—Frederick Fulforth.

Branch Exhibits—Edwin F. Ottens.

Outing—C. Brooks Ricca.

Plant Visitation—Albert Hirsch.

Registration—Charles J. Wilmore.

Secretary and Program—I. Wm. Marcovitch.

Sergeant-at-Arms — William H. Trusdell.

40th AES Convention Committee Chairmen: Standing, left to right: William H. Trusdell; Albert Hirsch; Charles J. Wilmore; Clarence E. Boerkel; Edwin F. Ottens; Nat. Verrelle; Alfred H. Pope; George M. Long. Seated, left to right: Norman H. Miller; Thomas M. Rodgers; D. Gardner Foulke (A.E.S. Executive Secretary); Samuel Heiman; Delmar R. Robson; Frederick Fulforth; I. William Marcovitch. Not shown in this picture: Mrs. D. R. Robson; Harry L. Hovis; C. Brooks Ricca; Hiram S. Lukens; A. Kenneth Graham.

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WASHING
MACHINES
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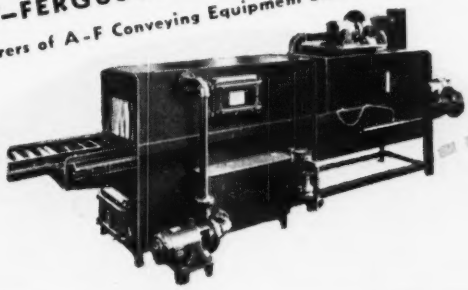
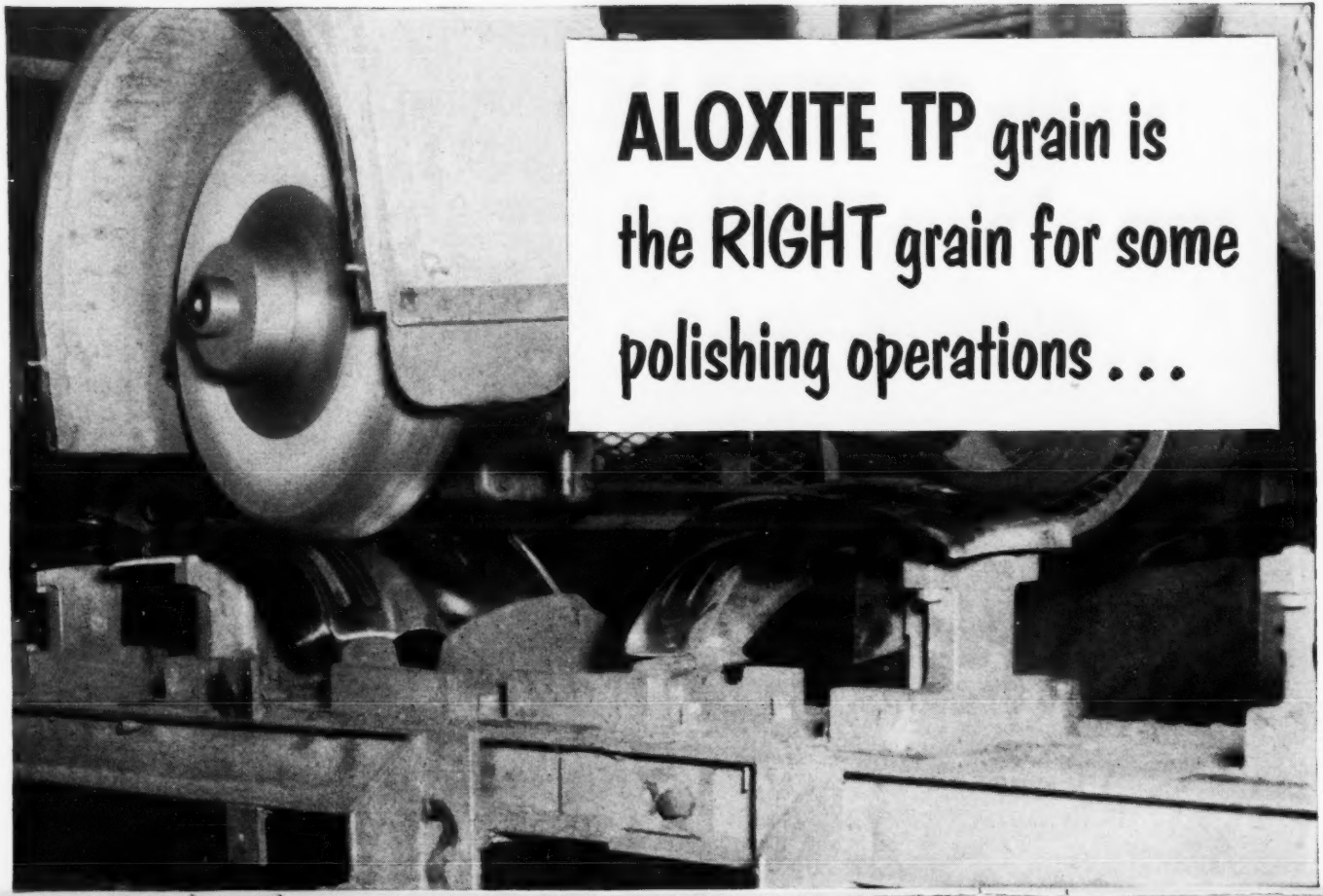
Manufacturers of A-F Conveying Equipment and Washing Machines for Industry




ALOXITE TP grain is
the RIGHT grain for some
polishing operations . . .

. . . and the right one for EVERY operation is among the other six in the complete line by CARBORUNDUM

ALOXITE TP grain is just one of the outstanding grain types in the most complete line available to industry. It's a tough, blocky aluminum oxide grain—ideal for polishing operations involving heavy stock removal on steel and other high-tensile-strength metals. If that's your problem, ALOXITE TP grain is *right* for you!

GRAIN TYPE	CHARACTERISTICS	PRIMARY USES
ALOXITE TPT Aluminum Oxide	Tough, sharp. Grits 16 through 100.	Polishing operations involving removal of large amounts of metal.
ALOXITE TPL Aluminum Oxide	Very sharp, friable. Grits 16 through 220.	Polishing low tensile strength metals—copper, brass, bronze, aluminum.
ALOXITE TPC Aluminum Oxide	Medium sharp. Grits 16 through 220.	General purpose polishing grain—for removal of small amounts of metal.
ALOXITE TPW Aluminum Oxide	Powder. Grits 240 through 1000.	As the abrasive in paste heading of polishing wheels and belts.
CARBORUNDUM RA Silicon Carbide	Sharp, very friable. Grits 10 through 240.	Polishing cast iron.
CARBORUNDUM RA Silicon Carbide	Powder. Grits 280 through 600.	General purpose polishing.

FOR FREE BOOKLET, "Abrasive Grain and Powders," write Dept. P 83-52R.

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. . . the ONLY source for EVERY abrasive product you need

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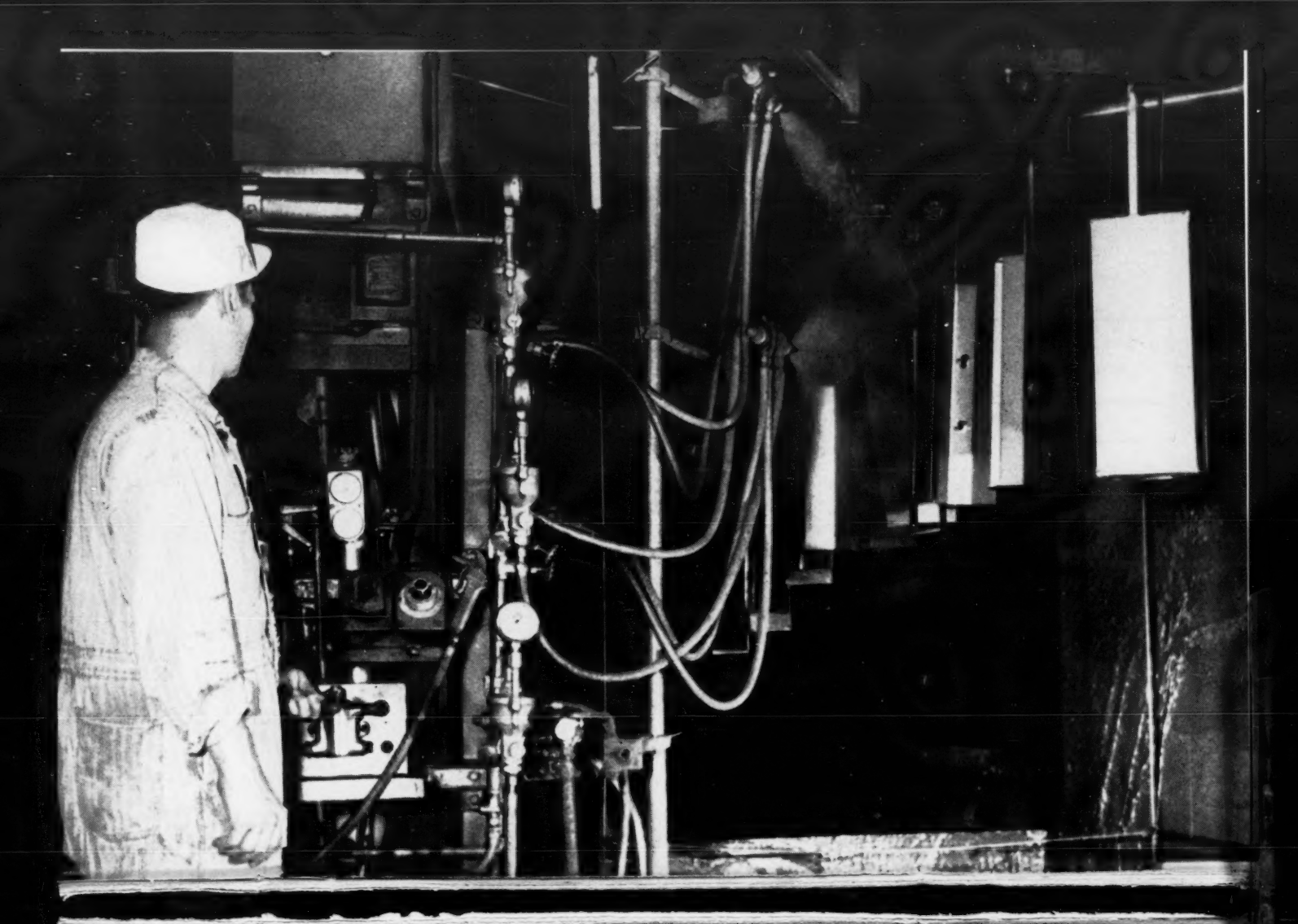
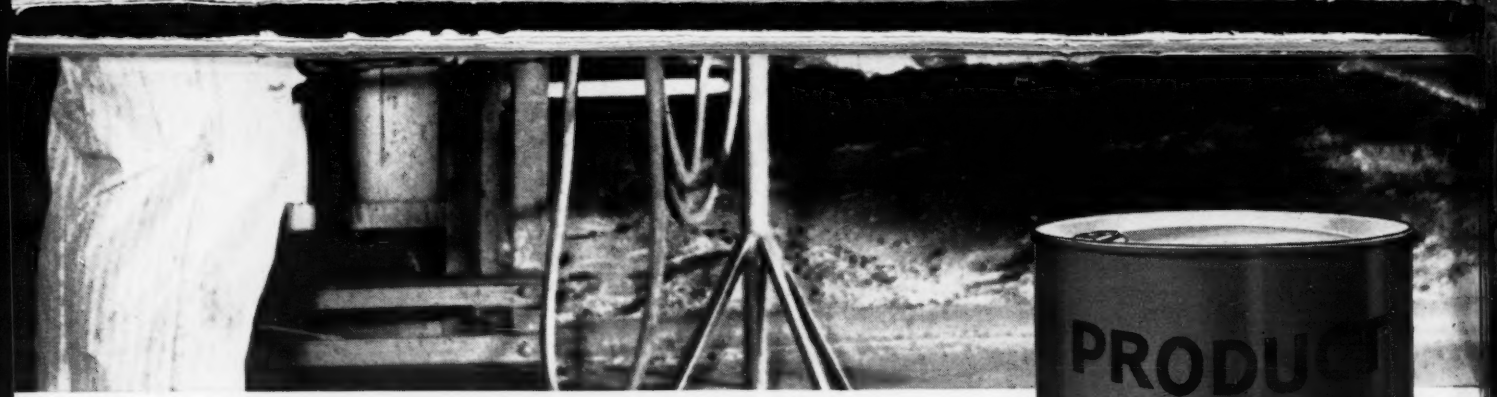




"HIGH CHARGE" CUTS FINISHING COSTS

The 100,000-volt field of this electrostatic painting system at Waterloo Valve Spring Compressor Co., is used to attract ionized paint particles directly to the product being finished, thus eliminating overspray and saving paint. Glidden's work in helping to develop this installation typifies our policy of cooperation in paint economy programs with our customers. We help them use less paint.

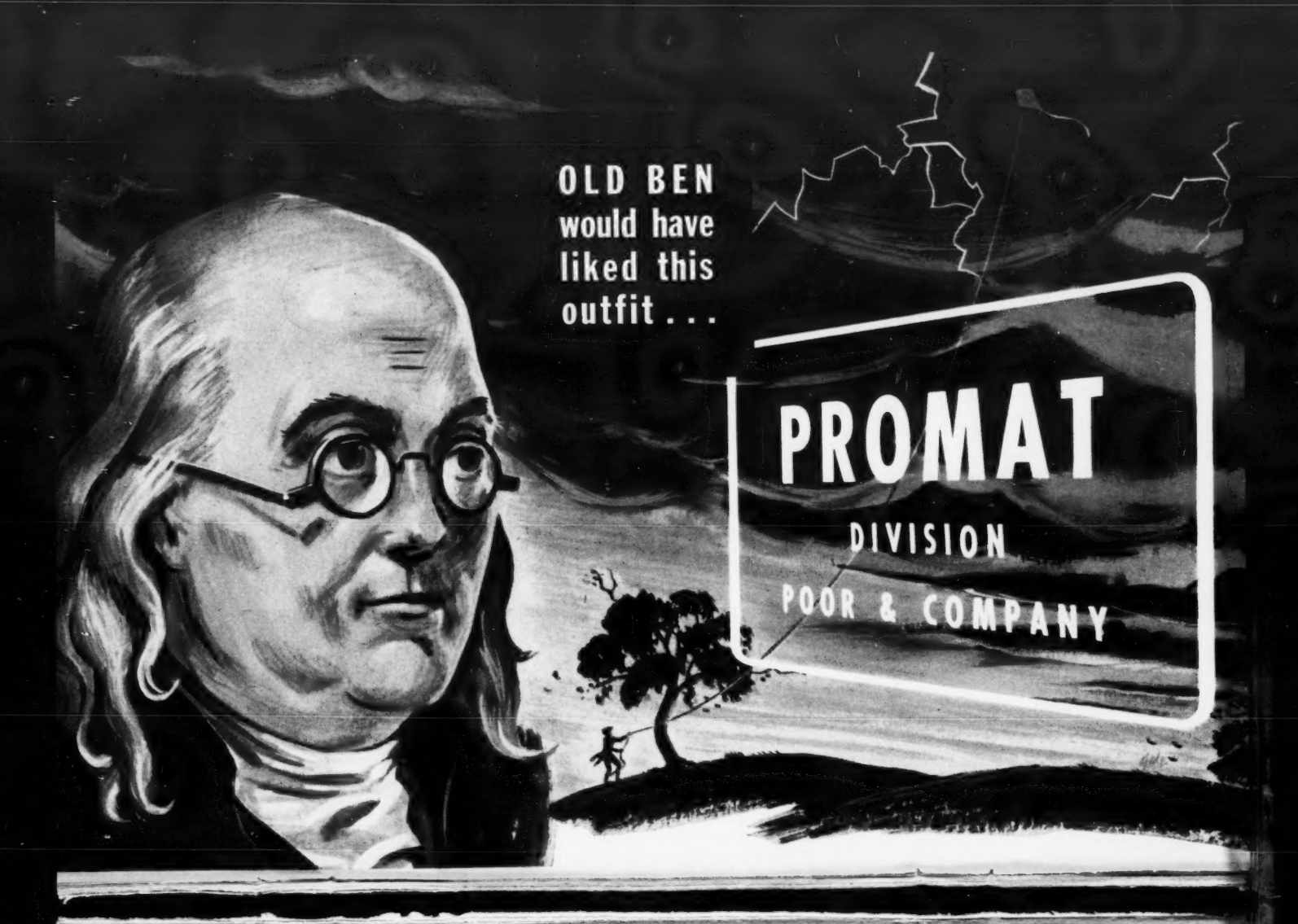
Glidden—leader in the development of quality product finishes—offers you a complete range of materials for electrostatic application . . . and competent technical assistance on *any* finishing problem.

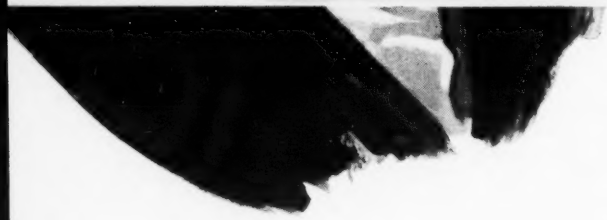
THE GLIDDEN COMPANY

INDUSTRIAL FINISHES DIVISION

11005 MADISON AVENUE • CLEVELAND 2, OHIO

SALES OFFICES AND FACTORIES: San Francisco, Chicago (Nubian Division—1855 North Leclaire Avenue), Minneapolis, New Orleans, St. Louis, Cleveland, Reading and Toronto.


OLD BEN
would have
liked this
outfit . . .
PROMAT
DIVISION
POOR & COMPANY



"Sloth, like rust, consumes faster than labor wears; while the used key is always bright"
Benjamin Franklin, *"Poor Richards Almanac,"* 1773

AT PROMAT OUR KEY is very bright from use. It's research. We use it to make better products for the plating industry—and more business for ourselves. Old Ben would have approved heartily of both the method and the motive.

Like Ben, we've flown a kite, or two, into the unknown with pretty fine results—a zinc electrolyte, Promat 99M2X, that's the easiest handling available; Probrite White Alloy, a new finish and a badly needed, tested alternate for nickel. We spent seven years developing what we think are the most effective protective films for zinc-cadmium, aluminum and magnesium. These are just a few typical Promat research developments.

We've grown because, like "Poor Richard," we believe, "by diligence shall we do more with less perplexity . . . God gives all things to industry."

PREPARATION: **addition agents • iron sequestering agents • foamers**

PLATING: **acid and alkaline zinc baths • cadmium baths • cyanide copper plating processes • Probrite White Alloy • Buffing grade Probrite**

PROTECTION: **chromate films for zinc, cadmium, aluminum and magnesium**

See you in Ben's home town for the
AES CONVENTION
JUNE 15-18

PROMAT

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POOR & COMPANY

851 S. MARKET STREET
WAUKEGAN, ILLINOIS

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F. J. MacStoker
President

D. G. Foulke
Executive Secretary

R. A. Schaefer
Second Vice President

CONVENTION REGISTRATION INFORMATION

(Eastern Daynight Saving Time Used Throughout This Program)

CONVENTION REGISTRATION is on the Mezzanine Floor.

Sunday, June 14.....
.....1:00 P. M.— 8:00 P. M.

Monday, June 15.....
.....8:00 A.M.— 5:00 P. M.

Tuesday, June 16.....
.....8:00 A.M.— 4:00 P. M.

Wednesday, June 17.....
.....8:00 A.M.—12:00 Noon

Thursday, June 18.....
.....8:00 A.M.—12:00 Noon

The registration fee of $15.00 provides each registrant with a book of tickets for the various events.

Table reservations for the Banquet on Thursday, June 18, should be made in advance at the Banquet Reservation Desk on the Mezzanine Floor, starting Wednesday, June 17, at 9:00 A.M.

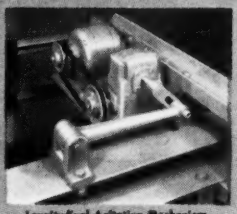
All events will be held in The Benjamin Franklin Hotel, unless otherwise noted.

Cleveland F. Nixon
Past President

George P. Swift
First Vice President

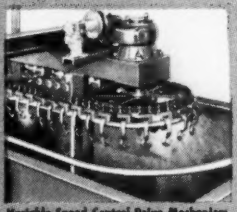
Clyde Kelly
Third Vice President

NEW WAGNER BROTHERS SEMI-AUTOMATIC SYSTEM

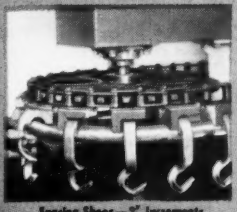


Longitudinal Agitating Mechanism

DOUBLES PLATING PRODUCTION



Variable Speed Control-Drive Mechanism



Spacing Shoes—2" Increments

Here's a new high in plating versatility, simplicity and economy of operation: A progressive plating plant replaced their still tanks with our standard semi-automatic package system; with *no increase in labor* they immediately increased production over 100% and *improved* quality. When the current long run is completed, the system will be altered for the next job by simply shifting to the desired spacing of the shoes (any dimension in 2" increments.)

There's no maintenance problem with this Wagner Semi. All wear points are Zerk lubricated; the Link-Belt roller chain is obtainable almost everywhere; the Micarta pusher blocks last indefinitely; variable speed control and drive mechanism are a unit, replaceable in minutes; the ball-bearing motor is totally enclosed, protected from drip, corrosion and moisture. The lateral agitating mechanism is mounted at one end on a single bracket and the tank is clear for loading at any point, all around. For uninterrupted plating and uniform quality, the 1⅜" anode bar radius is equidistant from the cathode at ends. The heavy sprocket shaft turns on three bearings, one outboard and two in speed reducer, for long life.

BEST OF ALL, the new Wagner Semi-Automatic comes ready for installation, completely bussed, ready to go. The price is so interesting you can figure right now to work it in with your present still tank operation or replace entirely, with economy and versatility for diversified parts plating work. Drop us a line or send the coupon for complete information and name of our representative near you.

Wagner

BROTHERS INC.

432 MIDLAND • DETROIT 3, MICH.

CHICAGO ROCHESTER CLEVELAND

CINCINNATI INDIANAPOLIS

Wagner Brothers, Inc., 432 Midland, Detroit 3

- ☐ Send name of representative
- ☐ Send information on Wagner Semi-Automatic
- ☐ Put me on your Price-Tips mailing list

Name _____ *Title* _____

Company _____

Address _____

City _____ *Zone* _____ *State* _____

General Program

SUNDAY, JUNE 14, 1953

10:00 A.M.—Executive Board Meeting in the Executive Secretary's suite.

2:00 P. M.—Metal Finishing Suppliers' Association, Inc., Board of Directors' Meeting, Benjamin Franklin Hotel.

8:30 P. M.—Informal Party for Convention Earlybirds, Betsy Ross Room.

MONDAY, JUNE 15, 1953

10:00 A.M.—Opening Session, Benjamin Franklin Hotel, Crystal Ballroom. Delegates will register at door before entering to eliminate roll call.

Invocation by THE REVEREND FRANK MESLE, Oneida, N. Y.

Greetings from the Philadelphia Branch by EDWIN F. OTTENS.

Introduction of Officers by DR. SAMUEL HEIMAN, Convention Chairman.

"Tomorrow's Challenge in the Delaware Valley" by J. HARRY LA BRUM, President, Philadelphia Chamber of Commerce.

"Electroplating in Australia" by DR. WILLIAM BLUM.

Business Meeting of the Supreme Society. FRANKLIN J. MacSTOKER, A.E.S. President, presiding.

12:00 Noon—Metal Finishing Suppliers' Association, Inc., Luncheon, Betsy Ross Room.

12:30 P. M.—Speakers' Luncheon, Coffee Shop, Benjamin Franklin Hotel.

2:00 P. M.—First Educational Session, Crystal Ballroom.
Admission by badge.

9:00 P. M.—International Fellowship Club Open House, Crystal Ballroom.
Sponsored by the Metal Finishing Suppliers' Association, Inc. Refreshments—Dancing. Buffet Supper served at 10:30 o'clock. Admission by ticket.

A DESPATCH continuous conveyor Multiple-stage Washer in operation. The view shows the entrance end.

A partial view of DESPATCH continuous conveyor Finish Bake Ovens on a large refrigerator finishing line.

Part of the heating equipment and control panels for the DESPATCH Finish Bake Ovens shown in the picture at left.

Why you should select **DESPATCH** for your FINISHING EQUIPMENT

Large plants, small plants, medium sized plants, all have selected and installed modern finishing systems by DESPATCH to best fit into their product finishing requirements. With more and better quality production at lower maintenance and operating costs, the major factors on the finishing lines, DESPATCH engineering and manufacturing skills are being constantly challenged. The ability of DESPATCH engineers and craftsmen to successfully meet this challenge is backed by over a half century of progress in supplying equipment to the metal working industries.

When you select DESPATCH Finishing equipment for your plant you are assured of the latest tried and proven designs, specifically engineered to fit your plant and give you long, dependable, economical service.

Write, wire or call
DESPATCH—Dept. C

If you are planning on new finishing equipment for your plant it will pay you to call DESPATCH. You can get one unit, such as a washer, spray booth or bake oven, or you can have a complete finishing system designed, fabricated and installed exactly to your requirements.

DESPATCH is as near to you as your telephone or mail box. Write, wire or call and a DESPATCH representative in your area will call with complete information.

MINNEAPOLIS OFFICE: 619 S. E. 9th St.
CHICAGO OFFICE: 4354 N. Broadway
Sales Offices in all Principal Cities

DESPATCH OVEN COMPANY

TUESDAY, JUNE 16, 1953

8:00 A.M.—Speakers' Breakfast, Coffee Shop, Benjamin Franklin Hotel.

9:00 A.M.—Second Educational Session, Crystal Ballroom.
Admission by badge.

12:30 P. M.—Branch Secretaries' Luncheon, Room 206.

1:00 P. M.—International Fellowship Club Annual Golf Tournament, Merion Golf Club, Ardmore.

2:00 P. M.—Third Educational Session, Crystal Ballroom.
Admission by badge.

8:00 P. M.—Question and Answer Period, Crystal Ballroom.
Moderator: DR. ABNER BRENNER, Baltimore-Washington Branch.
Panel: Authors of Educational Session papers.

WEDNESDAY, JUNE 17, 1953

8:00 A.M.—Speakers' Breakfast, Coffee Shop, Benjamin Franklin Hotel.

9:00 A.M.—Fourth Educational Session, Crystal Ballroom.
Admission by badge.
National Federation of Metal Finishers, Annual Meeting, Franklin Room.

1:00 P. M.—Outing on the Delaware River.
Steamer "Deleware Belle" leaves from Chestnut Street wharf. Catered luncheon will be served aboard steamer. Buses will start leaving hotel at Noon for wharf. Steamer will return about 6 o'clock. Admission by ticket.

2:00 P. M.—Research Committee Meeting aboard "Delaware Belle."

7:30 P. M.—Job Platers' Dinner, sponsored by the National Association of Metal Finishers, Inc., Room 206.

8:30 P. M.—Film: "Corrosion in Action," courtesy of International Nickel Company, Poor Richard Room.
Running time of film—approximately 1½ hours.

McKeon's
"Liquid Sulphur"
FOR COPPER STRIPPING NON-DANGEROUSLY
Economical, Non-Electrolytic.
No special equipment required.
Write for descriptive brochure.
Sulphur Products Co., Inc.
GREENSBURG 8, PA.

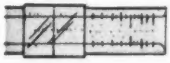
MASKING TAPE
DIE-CUT TO YOUR EXACT SPECIFICATIONS FROM
SCOTCH BRAND
INDIVIDUAL PIECES • ANY SIZE OR SHAPE
For quick, accurate masking operations.
PHONE OR WRITE PANOCO
505 Carroll St., Brooklyn 15, N. Y.

here's a phosphatizer that **really cleans!**

DuBOIS ION-KOTE

rinses perfectly!
. . . provides a uniform coating
. . . phosphatizes!

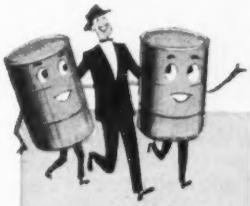
The DuBois Engineered Metal Cleaning program covers every phase of spray washer and immersion tank cleaning. For cleaning problems, here's the DuBois product: ION-KOTE . . . cleans better than any acid cleaner . . . it phosphatizes . . . provides uniform coating . . . gives complete, spotless rinse . . . deposits hard, dust-free, phosphate coating on metal, preventing rusting, increasing paint adherence.



FREE, handy plastic slide rule.
Write Dept. A.

The DuBOIS Co., Inc.
Cincinnati 3, Ohio Los Angeles 33, Calif.

DuBois warehouses and representatives are located coast-to-coast



TRIAL OFFER!
DuBois' exclusive Engineered Metal Cleaning Service includes this unusual trial offer. Get one drum of Ion-Kote on trial. If this product does not meet every one of the claims made for it, the unused portion of the drum can be returned for FULL credit.

THURSDAY, JUNE 18, 1953

7:45 A.M.—Research Committee Breakfast, Room 206.

9:00 A.M.—Research Educational Session, Crystal Ballroom.
Admission by badge.

12:00 Noon—National Federation of Metal Finishers, Board of Directors' Luncheon and Meeting, Room 210.

2:00 P. M.—Final Business Session, American Electroplaters' Society, Crystal Ballroom.
FRANKLYN J. MacSTOKER, A.E.S. President, presiding.

7:00 P. M.—Annual Banquet, Crystal Ballroom.
Admission only by reservation ticket. In order to be served, your registration book ticket must be exchanged for a special banquet ticket bearing a table reservation. Ticket exchange starts Wednesday, 9:00 A. M.
Excellent food, top-notch entertainment, prize awards and dancing.

They're All Talking About
IMMUNOL

✓ PREVENTS PLATING STAINS!
✓ PRESERVES BRIGHT FINISHES!
✓ PREVENTS RUST!

IMMUNOL is the surest, easiest and least expensive way to eliminate water stains on plated parts and to protect tumbled parts from rusting or dulling. In plating one ounce of IMMUNOL for every 10 gallons of water in the final rinse, hot or cold, does the job. In tumbling 4 ounces of IMMUNOL per gallon of water in a dip immediately after removing the parts from the barrel is the answer.

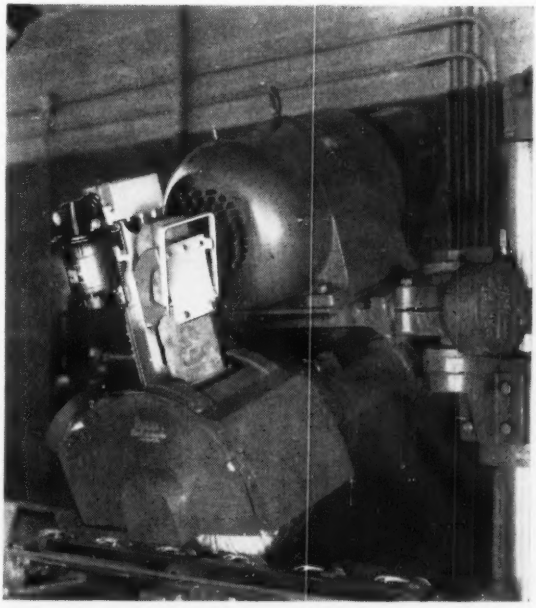
In either application no buffing is necessary, rejects are reduced and there is no need for subsequent removal of the deposited film which is so slight it can't be seen nor felt.

PROVEN IN USE FOR OVER TWO YEARS by finishers everywhere, you can't find a better solution to rust or stain problems.

FOR COMPLETE DETAILS SEND FOR ILLUSTRATED BOOKLET.

Haas MILLER Corp.
4th & BRISTOL STS. • PHILA. 40, PA.

. . . . 4 WAYS NANKERVIS *Automatic* COMPOUND APPLICATORS *Cut Down Buffing Costs . . . .*



1. SAVE ON LABOR

Nankervis compound applicators feature complete *automatic* operation on either single or multiple-head applications. Costly wheel tender's time is eliminated.

2. SAVE ON BUFFS

Automatic application means that just exactly the right amount of compound is applied—no burning from too little compound, no glazing from too much. Result: no quick wear from excessive raking.

3. SAVE ON COMPOUND

Efficient, "just-right" application means no waste. Automatic application of bar compound is cleaner, too!

4. CUT DOWN REJECTS

Uniform application of compound minimizes buffing rejects.

Yes, it's true!

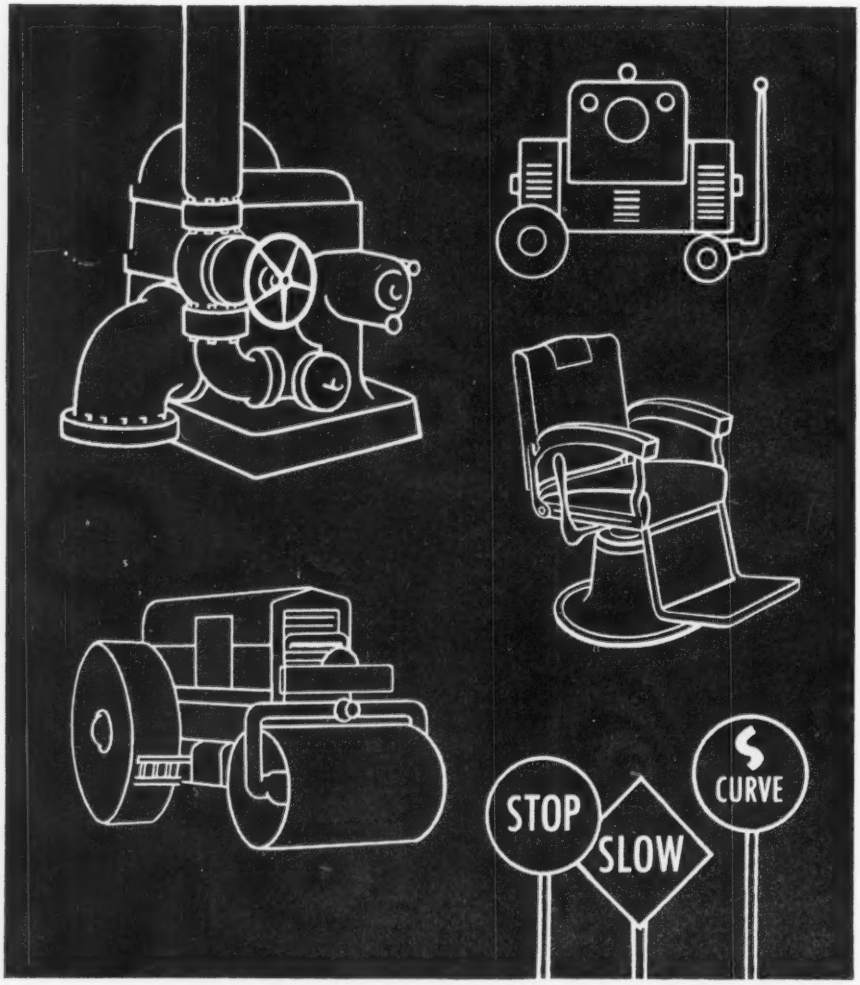
Nankervis automatic compound applicators can save you plenty—up to 40% of your buffing costs. Easily installed on any jack stand, semi- or fully-automatic buffing machine. Write today for Bulletin F-12.

GEORGE L. NANKERVIS COMPANY

Metal Finishing Equipment

19255 W. DAVIDSON AVENUE • DETROIT 23, MICHIGAN

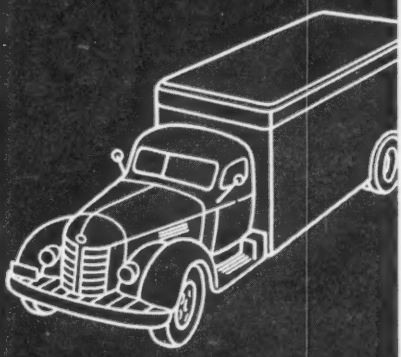
Lowe Brothers ZINOXIDE cuts spray booth



* ZINOXIDE is the ideal time-saving, money-saving primer for a wide variety of products—turbines, barber chairs, road rollers, welding equipment and road signs, to mention just a few. It adheres perfectly to all types of metal — even aluminum!

Primer handling time in half!

produces a better looking job— practically eliminates sanding



An Extra ZINOXIDE PLUS! Contains 2 of the best corrosion resisting pigments known to the paint industry! Products primed with ZINOXIDE can be stored *outside* without danger of rusting!

A midwestern truck body manufacturer* had heard about ZINOXIDE Primer—was intrigued—but wanted to see the *proof* in his own plant. A Lowe Brothers "Finishing Specialist" demonstrated its amazing qualities of adhesion and durability with impact and conical mandrel tests on a ZINOXIDE primed panel. Then, he put ZINOXIDE to the test on one of the large, hard-to-prime truck bodies—and here's what the manufacturer saw:

1. **ZINOXIDE flowed out smoothly** — NO OVERSPRAY, even where it was necessary to double back on corners.
2. **Dried in minutes**—smooth as velvet!
3. **Required no sanding** — except for minor touch-up where dirt was on the surface.
4. **Ready for finish coat immediately** — no time and effort spent pulling body out of booth to dry!
5. **Smooth, beautiful gloss,** without "orange peel," was secured in finish coat — proving ZINOXIDE'S excellent "hold out" qualities!

Now, Lowe Brothers ZINOXIDE is at work in this plant everyday—producing better looking results —saving time and money, too, by greatly reducing sanding and handling costs. You'll find that it will be worth your time to check into the possibilities of using ZINOXIDE. Write today for details —no obligation.

THE LOWE BROTHERS COMPANY • Dayton 2, Ohio
Industrial Division

This advertisement is based on facts from Lowe Brothers industrial case history files.

LEADERSHIP THROUGH CONSISTENT SERVICE

Lowe Brothers
FINISHES FOR INDUSTRY

Ladies' Program

LADIES' COMMITTEE HEADQUARTERS—INDEPENDENCE ROOM, BENJAMIN FRANKLIN HOTEL.

SUNDAY, JUNE 14, 1953

8:30 P. M.—Informal Party for Convention Earlybirds, Betsy Ross Room.

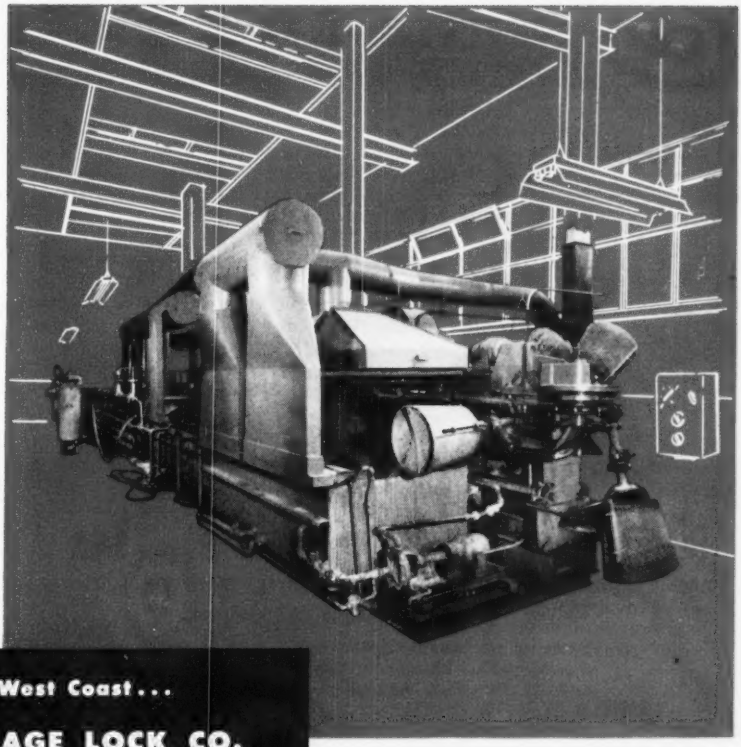
MONDAY, JUNE 15, 1953

10:00 A.M.—Opening Session, Crystal Ballroom.
The ladies are invited to attend with the men and hear a good keynote speaker talk on a non-technical subject.

2:00 P. M.—Tea at the Wanamaker Store Auditorium, 13th and Chestnut Streets.
Talk by MRS. REBA MILLER, "Getting To Know Your Neighbors" (illustrated with dolls of all nations). Admission by ticket.

9:00 P. M.—International Fellowship Club Open House, Crystal Ballroom.
Sponsored by the Metal Finishing Suppliers' Association, Inc. Refreshments—Dancing. Buffet Supper served at 10 o'clock. Admission by ticket.

The Ladies' Committee: (seated, left to right) Mrs. C. E. Boerckel, Mrs. A. G. Snow, Mrs. D. R. Robson, Mrs. E. R. Lanahan, Mrs. A. H. Pope; (standing, left to right) Mrs. I. W. Marcovitch, Mrs. S. Heiman, Mrs. W. A. Reynolds, Mrs. G. M. Long, Mrs. F. Fulforth, Mrs. E. F. Ottens.



On the West Coast...

SCHLAGE LOCK CO. assures a durable product with...

STEVENS

Automatic Equipment!

"We get a durable finish . . . better results . . . with our Stevens Automatic Barrel Plating Installation." That's the report of Schlage Lock Company of San Francisco.

They produce locks and other types of builders' hardware. In every case, precision is absolutely necessary to assure the dependability for which Schlage is famed.

That's where Stevens Automatic Barrel Plating Installation pays its way!

Automatic Zinc Barrel Plating assures durability . . . while it gives HIGH PRODUCTION. A Stevens automatic barrel machine again supplied the answer to a manufacturer's production problem.

Call your Stevens Sales Engineer for help with your metal finishing problems. Or write direct. FREDERIC B. STEVENS INC., DETROIT 16, MICHIGAN.

Visit us at the A.E.S. Convention, Room 414, Benjamin Franklin Hotel, Philadelphia, Pa., June 15-18.

FREDERIC B. STEVENS INCORPORATED

EVERYTHING FOR METAL FINISHING

DETROIT 16 MICHIGAN

BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS • NEW HAVEN

IN CANADA: FREDERIC B. STEVENS OF CANADA, LTD., TORONTO • MONTREAL • WINDSOR

TUESDAY, JUNE 16, 1953

11:00—A.M.—Aunt Ella Society Luncheon, sponsored by Oakite Products, Inc.

Host: DAVE CLARIN.

Buses leave hotel at 11 o'clock for Drexelbrook Inn, where luncheon will be served at 12:15. Immediately after lunch, the party will proceed by bus to Longwood Gardens, returning to the hotel by about 6 o'clock. Admission by ticket.

WEDNESDAY, JUNE 17, 1953

1:00 P. M.—Outing on the Delaware River.

Steamer "Delaware Belle" leaves from Chestnut Street wharf. Catered luncheon will be served aboard steamer. Plato Party on board. Buses will start leaving hotel at Noon for wharf. Will return about 6 o'clock. Admission by ticket.

Through the kind assistance of Oneida, Ltd., Oneida, N. Y. (intercession of our good A.E.S. friend Danny Gray), there will be a beautiful display of silverware.

The J. J. Siefen Co., 5643 Lauderdale, Detroit 9, Mich., will give each lady a piece of Coro jewelry.

The W. Green Electric Co., 130 Cedar St., New York City, will give each lady the traditional double deck of playing cards.

THURSDAY, JUNE 18, 1953

9:30 A.M.—Hotel Breakfast in the Garden Terrace, followed by a two-hour sightseeing trip through historic Philadelphia.

Sponsored by Lea Manufacturing Company. Featured at the Breakfast will be the popular Ladies' Educational Session. Subject: "What Every Woman Should Know" by R. CRANE of Lea. Admission by ticket.

7:00 P. M.—Annual Banquet, Crystal Ballroom.

Admission only by reservation ticket. In order to be served, your registration book ticket must be exchanged for a special banquet ticket bearing a table reservation. Ticket exchange starts Wednesday, 9:00 A. M. Excellent food, top-notch entertainment, prize awards and dancing.

Doesn't YOUR product deserve a MOCO surface?

MOCO BUFFING COMPOUNDS

The "Long Mileage" line for all finishing requirements

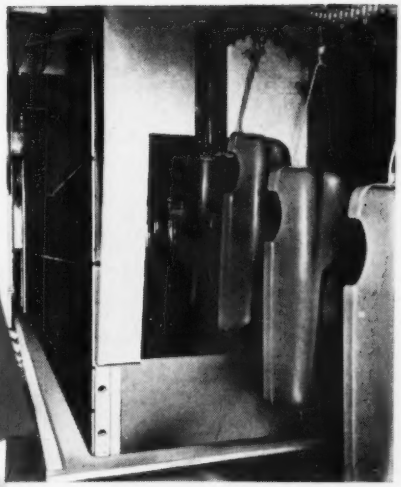
MOCO TUMBLING BARREL COMPOUNDS

To keep pace with modern barrel finishing techniques

WE INVITE YOUR INQUIRIES

THE MOSHER COMPANY · 15 Exchange St., Chicopee, Mass.

"16 Hours' Work Cut to 10 *with* JENSEN PAN·L·HEAT!"



42-ft. Pan•L•Heat oven at BMC Manufacturing Corp., Binghamton, N.Y. Total connected load is 203 KW. Operating temperature: approx. 300° F. Oven handles *ALL* colors—without special temperature adjustments.

BMC MANUFACTURING CO., LEADING MAKER OF QUALITY WHEEL TOYS, REPORTS:

"Finishing operations at BMC are now producing in 10 hours the amount of work that previously required 16 hours, *and at no increase in operating cost*—thanks to our recently installed Jensen Pan•L•Heat oven. Our wheel products are coming out with a harder, more lustrous finish. In its nine months of operation, it has never been shut down for maintenance or repair. We're convinced Pan•L•Heat is the finest infra-red Calrod oven available."

Get *ALL* the facts from your nearest Jensen sales engineer. Distributors in principal cities.

Write for 16-page Jensen Pan•L•Heat brochure.

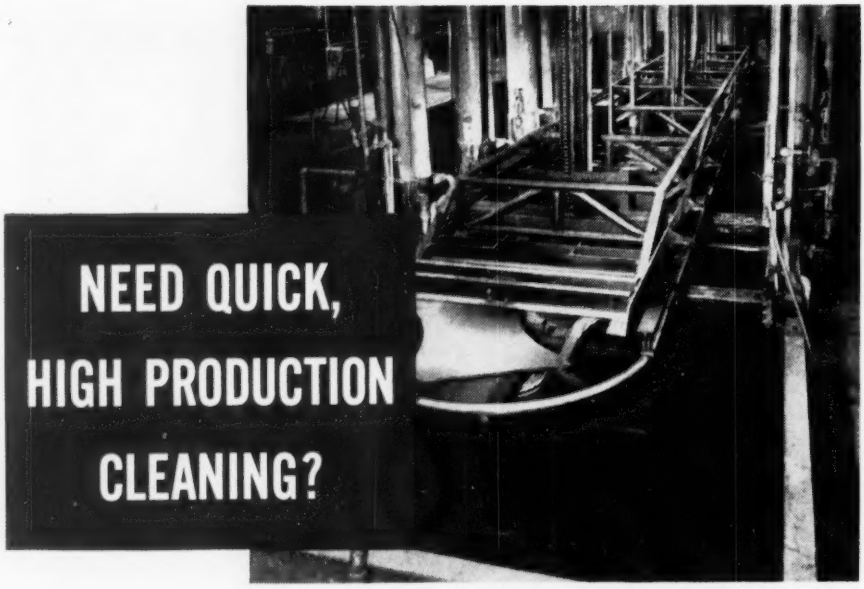
JENSEN PAN•L•HEAT:

- Increases pay load realization by improving oven efficiency.
- Uses electric heat more effectively at low cost.
- Improves quality and uniformity of production.
- Gives superior results with shorter heating cycles—at lower energy consumption.

Jensen SPECIALTIES, INC.

PAN-L-HEAT Ovens

9331 Freeland Ave.
Detroit 28, Michigan



METAL MOULDINGS CORPORATION OF DETROIT DOES IT AUTOMATICALLY

with UDYLITE EQUIPMENT!

"We had to have a FAST . . . yet SURE . . . method of cleaning our automotive stampings before plating. And these stampings are *really* intricate shapes. That's why we chose AUTOMATIC cleaning using a Udylite Full Automatic."

Yes, that's what the people of Metal Mouldings Corporation, Detroit, Michigan, told Udylite. They must combine a large volume of cleaning with no rejects. They found that Udylite equipment assured them of high production...while it saved time and manpower.

If you have cleaning problems . . . let the Udylite Corporation provide the answer. Your Udylite Technical Man will show you a faster, more economical, AUTOMATIC way to clean metal parts. Call him today or write direct for all the facts.

THE UDYLITE CORPORATION, DETROIT 11, MICHIGAN. *West of Rockies, L. H. Butcher Co., Los Angeles 23, California.*

PIONEER OF A BETTER WAY IN PLATING

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

Udylite

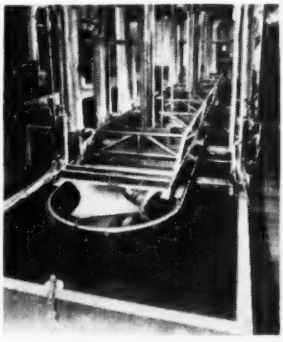
METEX
CHROMEFOME
ZINCTEX
DYCLENE "E"
ROCHELTEX
ALUMETEX
ANODEX
TROXIDE
BLACKMAX
SOLVMAX "X"
CHROMETEX
ALUM-I-NIEL

CLEANING SUPPLIES WORK *FASTER, BETTER, MORE ECONOMICALLY!*

Whether used with Full Automatic Cleaning Equipment, still tanks or barrels, Udylite-MacDermid cleaners are best! Udylite has the answer to *your* metal cleaning problems:

Steel Base—Electrolytic, soak, spray or general purpose compounds. Especially adapted for cleaning steel base materials either with direct or reverse current.

Typical Full Automatic Cleaning Installation at Metal Mouldings Corp., Detroit, Michigan



Brass and Die Castings—Electrolytic, soak, spray and burnishing compounds are ideal for brass, zinc, and aluminum diecastings.

Specialties—For all special metal cleaning problems.

Call your Udylite Technical Man for the complete story or write direct. The Udylite Corporation, Detroit 11, Michigan. *West of Rockies, L. H. Butcher Company, Los Angeles, California.*

PIONEER OF A BETTER WAY IN PLATING

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

A. J. EMMERICH
Sales Mgr.

CLARENCE DE GROAT
Detroit

CLAY SAYERS
Southern Ohio

A. EDWARD SMITH
Indiana

See you in PHILADELPHIA

JOHN F. SIEFEN
Exec. Vice-Pres.

Meet these qualified Siefen Sales Engineers, who will be at the A.E.S. Convention, to discuss with you the latest developments in metal finishing. *AND*—who are always ready to serve you at your factory.

Distributors: O. J. Jacobsen, Los Angeles; Len Pravel, Inc., Chicago. Jobbers in other localities.

ALVIN SEELEY
Cleveland

J. J. *Siefen* CO.
5643 LAUDERDALE · DETROIT 9, MICH.

IVAN HOOD
Central New York

ELDON BRISSON
Michigan

ALFRED DARNELL
New England

HARVEY BLIZZARD
Detroit

More lives than a cat

...Monel

You get more service life out of Monel® pickling equipment than a cat gets out of his nine lives.

In pickling operations, Monel withstands the corrosive action of acids. It's tough. It's durable. Gives years of trouble-free service. And it can readily be repaired to give it a new lease on life.

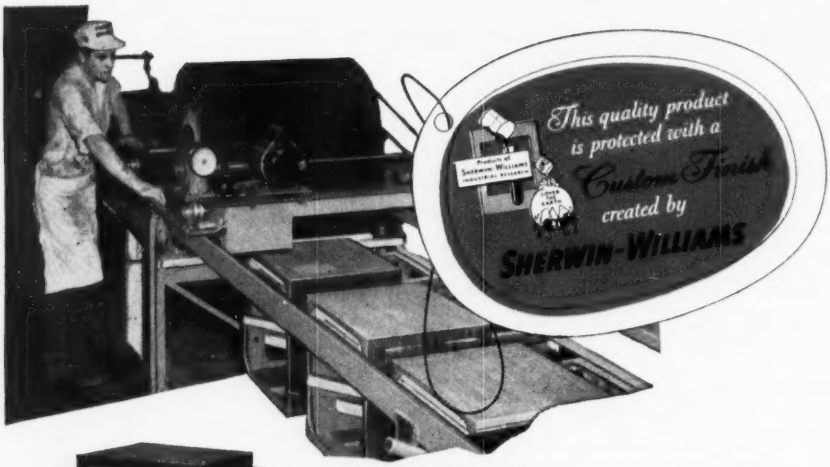
These days it is advisable to place equipment orders with your supplier well in advance of scheduled use. Distributors of Inco Nickel Alloys can supply the latest information on availability from warehouse and mill. Meanwhile, write for a copy of "5 Way Savings . . . in Pickling." It's yours for the asking.

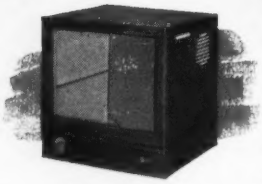
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

INCO

Monel
PICKLING EQUIPMENT

extra life
extra capacity
extra safety





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SPEEDS TV CABINET OUTPUT!

TV cabinets with the luxury look of finest grained wood . . . accomplished with time and money-saving advantages inherent with metal finishing! It's a production achievement of Doehler Metal Furniture Co., New York, New York—leading maker of quality metal and wood furniture—in the manufacture of TV cabinets for a large producer of electrical equipment.

"Wood graining" is done through a unique, semi-automatic process that minimizes finishing time, yet produces an accurate appearance of expensive wood cabinets. Cabinets are first coated with a specially formulated Sherwin-Williams metal primer, which provides the proper base color. Then, a perfectly simulated wood grain pattern is imprinted onto the primer, followed by a Sherwin-Williams mar-resistant lacquer. The soft, hand-rubbed lustre of this final finish gives depth to the pattern . . . adds to the appeal of the finished cabinets.

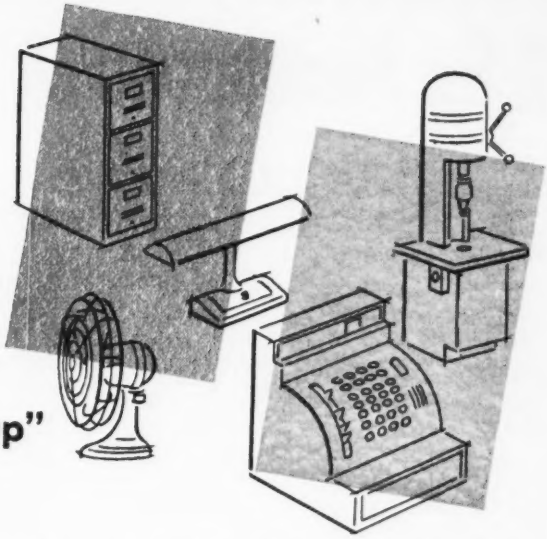
May we help you, too? Whatever your requirements, you can get qualified help through your Sherwin-Williams Industrial Representative. Ask him, too, about Sherwin-Williams identification aids. There's no better way to take advantage of an outstanding product feature—the finish—than by identifying it with the Sherwin-Williams name and trade mark. For details, write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

3 WAYS

to glamorize "hard-to-dress-up" products



Here's how to get attractive, textured and third dimensional effects . . . conceal surface blemishes, weld marks, minor imperfections. A choice of three ways provides a variety of interesting patterns, infinite shadings of tone—

1. **DIMENSO® ONE-COAT "HAMMERED" METALLIC**—Produces a striking 3-dimensional hammered pattern in a single coat.
2. **DIMENSO® ONE-COAT OPALESCENT**—By modifying the method of application, a variety of rich opalescent effects can be obtained.
3. **KEM® ART METAL**—Durable and distinctive nonmetallic wrinkle finishes. Makes possible highly decorative effects.

Get the facts from your nearby Sherwin-Williams Branch. Consult your classified telephone directory for location. Or write The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

Services of trained industrial finish specialists available in your area through nearest Branch

SHERWIN-WILLIAMS

INDUSTRIAL FINISHES

G.E. Announces A Complete

RECTIFIER STACKS have much longer life. Selenium stacks exactly like those used in unit have already lasted over 60,000 hours. Copper-oxide rectifiers, operated at proper rating, last almost indefinitely.

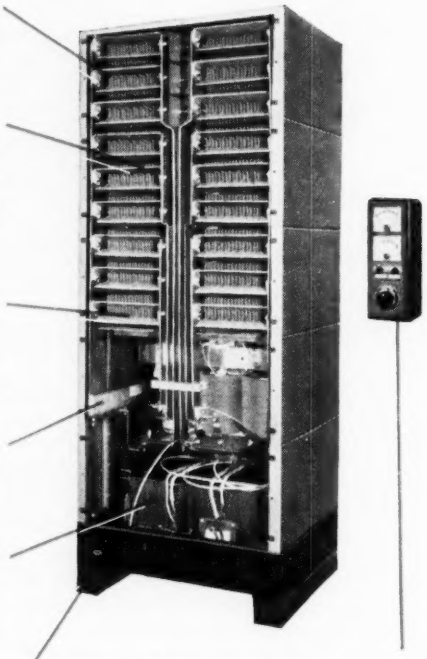
PROTECTION Transformer coils are protected against corrosive atmospheres by heat impregnation. Acid-resistant paint protects rectifiers. Oil-immersed selenium stacks are available for thorough protection against severely corrosive conditions, when required.

FORCED AIR COOLING Fan draws air in from the front of the unit, across and down over the stacks, transformer and saturable reactor. This design avoids dust and dirt intake, and permits solid top for protection against dripping.

BUSBARS Heavy busbars are arranged for line-up mounting of several units. They are brought out at the rear of the casing near the bottom in floor-mounted models.

SENSITIVE CONTROL is achieved by the use of a saturable reactor to control output without the use of any resistors, It is employed on manually and automatically regulated power systems. Latest developments in magnetic amplifier design are used for regulating circuit.

STURDY CONSTRUCTION Casing on floor-mounted units is ⅛-inch sheet steel and expanded steel screening. Base is reinforced by steel members and designed for moving by fork truck. Front and rear panels are easily removable.



CONTROL STATION Designed for wall mounting either beside the tank or power supplies, the operator's control station is provided with manually controlled and automatically regulated power supplies. It includes voltmeter, ammeter, voltage level control device, and START-STOP push buttons where specified.

LABORATORY PLATERS

BARREL PLATERS

MANUALLY CONTROLLED

AUTOMATICALLY REGULATED

New Plating Rectifier Line

ALL RATINGS OFFER INCREASED EFFICIENCY AND CONVENIENCE AT LOWER PRICES

General Electric's new complete line of plating rectifiers includes manually controlled and automatically regulated power supplies, as well as equipment for barrel plating and precision laboratory work. Lower in price, the new line also offers both greater economy and more convenience in operation.

NEW EASE OF OPERATION A separate operator's control station controls the entire d-c output of the system, regardless of the number of individual units employed. Saturable reactor controls are used on manually and automatically regulated power systems for precise regulation and quick response.

NEW FLEXIBILITY Manually controlled units can be converted at any time to automatic regulation of current, voltage, or for anodizing, by the addition of an automatic regulator.

NEW OPERATING ECONOMY By using either selenium or copper-oxide rectifier stacks, depending on which is more efficient for desired rated output, and by using proper circuits, much greater operating efficiency has been obtained. This means you get greater operating economy now and in the future.

EXTREMELY LONG LIFE Selenium stacks identical to those incorporated into these new plating rectifiers have already lasted over 60,000 hours on test. Life of copper-oxide rectifiers operated at proper rating is almost infinite. Special acid-resistant finishes protect stacks, transformer and components against corrosive atmosphere.

ALMOST NO MAINTENANCE The cooling design of the equipment takes air in from the front, across and down over the components, to minimize dirt and dust intake. The fan is the only moving part in the entire unit, and it requires only occasional lubrication.

MORE INFORMATION is yours for the asking. See your nearest G-E Plating Rectifier Agent or G-E Apparatus Sales Office, or write Section 464-12E, General Electric Co., Schenectady 5, N. Y.

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Plating Plant Tours

Arrangements have been made for visits to the following plants: RCA-Victor, Philco Corporation, Ternstedt Division of General Motors Corporation, Snyder Manufacturing Company, Progress Manufacturing Company and Triangle Publications.

Registrants desiring to visit other plants in this area should consult a member of the Plant Visitations Committee who will assist in securing permission and arranging transportation.

Albert Hirsch

Chairman
Plant Visitations Committee

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SALT SPRAY TESTER
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A Few of the Many Types Produced by
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M. F. S. A. Golf Tournament

The Metal Finishing Suppliers' Association Golf Tournament will be held on Tuesday, June 16th, at the Merion Golf Club in Ardmore, just outside of Philadelphia. The Club has stipulated that high handicap golfers play the West Course and low handicappers play the East Course.

The East Course is regarded as one of the finest golf courses in the country, and the opportunity of playing this course should prove to be a rare treat to A.E.S. golfers.

All three of the major events of the U. S. G. A. — the Open, the Men's and Women's Amateurs — have been played at Merion. Bobby Jones won his first U. S. A. C. here in 1924. The U. S. Open was played here in 1934, won by Olin Dutra, and in 1950, won by Ben Hogan.

Merion's famous East Course has two distinctive characteristics. One is that there are no blind shots or hidden dangers;all the trouble is in plain sight. The other is the individual character of each hole; in all the eighteen, there are no two remotely alike in contour.

The course has no soft spots. Even the tenth, which is generally accounted the least exacting of the eighteen, can penalize severely a wandering drive or erratic approach.

The East Course is unconventional in that the two longest holes are the second and the fourth and these are the only par five holes on the course. There are four par threes, well varied in distance and the style of tee shot required to reach the green.

Specific details regarding the MFSA Golf Tournament can be obtained at A. E. S. Convention Headquarters.

J. J. Duffy, Jr.
Golf Chairman

Educational Program

Raymond F. Vines

FIRST SESSION

Monday Afternoon, June 15, 2:00 P.M.
Crystal Ballroom, Benjamin Franklin Hotel

RAYMOND F. VINES, Lancaster Branch
Presiding

1—"Bright Gold Plating."
By EDWIN C. RINKER, Sel-Rex Precious Metals, Inc., Belleville, N. J.

2—"Statistical Quality Control—A New Tool for the Electroplater"
By EZRA A. BLOUNT, Products Finishing, Cincinnati, Ohio.

3—"A Corrosion Study of Various Chromium-Plated Electrodeposits."
by DR. HENRY BROWN and E. W. HOOVER, The Udylite Corporation, Detroit, Mich.

4—"Iron Plating from an Alkaline Bath."
By DR. HENRY B. LINFORD, Columbia University, EDWARD F. FOLEY and DR. WALTER R. MEYER, Enthone, Inc., New Haven, Conn.

Abstracts of Preceding Papers

Bright Gold Plating, *by Edwin C. Rinker.*

This paper presents the industrial requirements and applications for bright gold plating. Principles, bath composition and plate distribution are discussed. Bright and conventional electrodeposits are compared with respect to corrosion resistance, abrasion resistance, smoothness and hardness.

Statistical Quality Control—A new Tool for the Electroplater, *by Ezra A. Blount.*

The principles of statistical quality control are finding increasing acceptance in the electroplating industry. The author discusses applications with respect to the variables controlled and plating plants employing such control methods. It is shown that a reduction in number of rejects as well as savings in metal can be accomplished.

A Corrosion Study of Various Chromium-Plated Electrodeposits, *by Dr. Henry Brown and E. W. Hoover.*

Results are presented for outdoor (industrial atmosphere) exposure, salt-spray and humidity tests on electrodeposits as foils and when plated on steel, nickel, copper, nickel-cobalt, nickel-iron, white brass with and without a final chromium plate and then are compared and discussed in terms of inherent and induced porosity.

Iron Plating from an Alkaline Bath, *by Dr. Henry B. Linford, Edward F. Foley, Jr. and Dr. Walter R. Meyer.*

An alkaline iron electroplating solution is described. The composition of the solution is given and the effect of varying the concentration of the constituents and the temperature on the cathode efficiency and operating characteristics are shown.

Dr. R. M. Wick

SECOND SESSION

Tuesday Morning, June 16, 9:00 A.M.

Crystal Ballroom, Benjamin Franklin Hotel

DR. R. M. WICK, Allentown—Reading Branch Presiding

1—"Black Chromium-Base Electroplating."
by DR. MARTIN F. QUAELY, Westinghouse Electric Corporation, Bloomfield, N. J.

2—"Crack-Free Chromium—A New Process."
By R. DOW and DR. J. E. STARECK, United Chromium, Inc., Detroit, Mich.

3—"Cost Determination in the Industrial Chromium Plating Job Shop."
By W. F. WALTON and P. B. LONSBURY, Walton and Lonsbury, Attleboro, Mass.

4—"Stability of Ion-Exchange Resins Toward Chromic Acid Plating Solutions."
By C. FREDERICK PAULSON, Permutit Company, New York, N. Y.

Abstracts of Preceding Papers

Black Chromium-Base Electroplating, *by Dr. Martin F. Quaely.*
Black chromium finishes, which have good adhesion, can be easily applied and can be heated in high vacuums to 500 degrees C. Three baths which yield deposits to meet these conditions are described in detail with regard to composition and operating conditions.

Crack-Free Chromium—A New Process, *by R. Dow and Dr. J. E. Stareck.*
A process for producing crack-free chromium electrodeposits is described. The plating characteristics of the process and the results of outdoor exposure and salt-spray corrosion tests on steel plated by the process, with and without undercoatings, are reported. Other physical properties are reviewed and illustrated.

Cost Determination in the Industrial Chromium Plating Job Shop, *by W. F. Walton and P. B. Lonsbury.*
The authors describe a method of price determination successfully used in an industrial chromium plating shop. This method, based on a plating tank-hour charge, has variations to adapt it to the special conditions encountered in depositing heavy chromium coatings. The method described is adaptable to small or large operations.

Stability of Ion Exchange Resins Toward Chromic Acid Plating Solutions, *by C. Frederick Paulson.*
A new cation exchange resin which is resistant to 40 per cent chromic acid solutions is reported in contrast to earlier resins which were unstable above 10 per cent chromic acid. A description of an ion exchange unit for service with concentrated chromic acid solutions is given and operating data are presented. The stability of anion exchangers is also discussed.

George Schore

THIRD SESSION

Tuesday Afternoon, June 16, 2:00 P.M.

Crystal Ballroom, Benjamin Franklin Hotel

GEORGE SCHORE, New York Branch Presiding

1—"A Study of Cyanide Decomposition."
By DR. E. J. SERFASS, DR. RALPH F. MURACA, Lehigh University, and DR. WALTER R. MEYER, Enthone, Inc., New Haven, Conn.

2—"An Evaluation of Carbonate Removal Methods."
By R. SCOTT MODJESKA, Scientific Control Laboratories, Chicago, Ill.

3—"A Further Study on the Effect of Abrasive Metal Polishing on the Character of Nickel Plate."
By WALTER L. PINNER, Houdaille-Hershey Corporation, Detroit, Mich.

4—"Plating on Molybdenum."
By A. KORBELAK, Plating, Newark, N. J.

Abstracts of Preceding Papers

A Study of Cyanide Decomposition, *by Dr. E. J. Serfass, Dr. R. F. Muraca and Dr. Walter R. Meyer.*
This paper evaluates the factors responsible for the loss of cyanide from cyanide plating solutions and presents method of minimizing these losses. The formation of carbonate, cyanate, ammonia and formate are discussed.

An Evaluation of Carbonate Removal Methods, *by R. Scott Modjeska.*
This paper presents a study of "freezing-out" and precipitation methods for the removal of carbonate from copper, silver, zinc, cadmium and brass cyanide plating baths. Evaluation of the method is based upon the type of deposit obtained after treatment and the difficulty of the treatment.

A Further Study on the Effect of Abrasive Metal Polishing on the Character of Nickel Plate, *by Walter L. Pinner.*
By means of photomicrographs, the character of steel surfaces created by various abrasive polishing procedures is shown and the effect of such surfaces on the quality of electrodeposited nickel is discussed with respect to smoothness, buffability and corrosion resistance. The beneficial effect of certain electrochemical treatments with respect to the removal of fragmented particles prior to plating is discussed.

Plating on Molybdenum, *by A. Korbelak.*
A thin protective metal coating is required over molybdenum because of its poor oxidation resistance at elevated temperatures. Various methods used for the production of adherent electrodeposits over molybdenum are described. Industrial applications of electroplated molybdenum are mentioned.

E. R. Bowerman

FOURTH SESSION

Wednesday Morning, June 17, 9:00 A.M.

Crystal Ballroom, Benjamin Franklin Hotel

E. R. BOWERMAN, New York Branch Presiding

1—"An Electronic Thickness Gage."
By DR. ABNER BRENNER, National Bureau of Standards, Washington, D. C.

2—"The Thickness of Electrodeposits by the Anodic Solution Method."
By C. F. WAITE, King-Seeley Corporation, Ann Arbor, Mich.

3—"Testing Organic Finishes and Interpretation of Results."
by CARROLL O. HUTCHINSON, The Glidden Comapny, Chicago, Ill.

Abstracts of Preceding Papers

An Electronic Thickness Gage, *by Dr. Abner Brenner.*

An electronic thickness gage based upon the skin effect is described. This method is applicable to a large variety of coatings on basis metals if the coating and basis metal differ in conductivity, e.g., silver on brass or lead on copper. The measurements are non-destructive.

Thickness of Electrodeposits by the Anodic Solution Method, *by C. F. Waite.*

This paper describes the difficulty experienced using the hydrochloric acid drop test for chromium over copper. It also details a test unit which was developed for thickness measurements based on the principle of electrolytic solution or stripping of a definite area of plate by known amount of current. This method gives results accurate to plus or minus five per cent. Other applications of the method are discussed.

Testing Organic Finishes and Interpretation of Results, *by C. O. Hutchinson.*

The author describes over sixty properties of organic finishing materials used as a basis of evaluating these coatings. He also lists standard test procedures for most of these properties, together with essential control conditions and typical values for some industrial products on which these tests are used. He presents a bibliography of valuable references on testing of organic finishes and interpretation of results. This paper should be very valuable reference to those who have responsibility for organic finishes in addition to electroplated coatings.

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Dr. Donald M. Price

FIFTH SESSION

Thursday Morning, June 18, 9:00 A.M.

Crystal Ballroom, Benjamin Franklin Hotel

DR. DONALD M. PRICE, Research Committee Chairman Presiding

REPORT ON A.E.S. RESEARCH PROGRAM

1—"The A. E. S. Research Program."
by DR. DONALD M. PRICE, Oakite Products, Inc., New York, N. Y., Research Committee Chairman.

2—"The Analysis of Electroplating Solutions for Major Constituents." (Project No. 2)
By DR. E. J. SERFASS, Lehigh University, Bethlehem, Pa.

3—"The Effect and Removal of Chromium from Nickel Plating Solutions." (Project No. 5)
By DR. D. T. EWING, J. K. WERNER, A. A. BROUWER and C. J. OWEN, Michigan State College, East Lansing, Mich.

4—"A Metallographic Study of Some Steels Used for Nickel Plating." (Project No. 14)
By DR. A. E. R. WESTMAN, Toronto, Canada.

5—"A Progress Report on the Development of a New Accelerated Corrosion Test." (Project No. 15)
By WALTER L. PINNER, Houdaille-Hershey Corporation, Detroit, Mich.

Abstracts of Preceding Papers

The A. E. S. Research Program, *by Dr. Donald M. Price*.

The Chairman of the Research Committee summarizes the accomplishments of the Research Committee during the past few years and stresses the value to the electroplating industry. Some of the problems facing the Research Committee are discussed.

The Anaylsis of Electroplating Solutions for Major Constituents, *by Dr. E. J. Serfass*.

As a part of A.E.S. Research Project No. 2 dealing with the analytical methods for the determination of trace constituents in plating baths, and trace constituents in industrial finishing wastes, a program involving the study of analytical methods for major constituents in plating baths has been completed. Methods for the analysis of the major constituents of common nickel plating baths have been evaluated. These methods include procedures for the determination of nickel, boric acid, sulfate, chloride, etc. Methods for the determination, and cost per determination have been made on all of the methods.

Evaluation of the presently available methods for major constituents have been made with a view towards presenting the plater with simple, rapid, yet precise procedures for the control of nickel and copper plating baths.

The Effect and Removal of Chromium from Nickel Plating Solutions, by Dr. D. T. Ewing, J. K. Werner, A. A. Brouwer, and C. J. Owen.

This paper is one of a series on the effects of impurities and the purification of solutions for the electrodeposition of nickel. The effects of chromium as an impurity have been investigated and data are presented which indicate the accompanying changes in such physical properties of the electrolytic nickel as adhesion, ductility and hardness. The effect of chromium on covering power and salt spray corrosion resistance, is also reported.

The rate of removal of chromium from nickel plating solutions is reported for reduction followed by precipitation and the differing effects of trivalent and hexavalent chromium are pointed out.

A Metallographic Study of Some Steels Used for Nickel Plating, by Dr. A. E. R. Westman.

A review is presented of the various types of steel-killed, semi-killed and rimming which may be encountered by the electroplater in his work.

The micro-structures of a number of steels used in the industry and chosen more or less at random as subjects for examination are shown and discussed.

The results of a study of surface finishes having different Profilometer readings are given. In this study 5 degree taper sections of the polished and etched surfaces were examined and photographed at various magnifications and under various conditions of illumination. In this way the structure of the steel immediately below the polished surfaces is brought out clearly The characteristics of this structure in various samples are dealt with and interesting information regarding the effects of different modes of surface preparation is presented.

A Progress Report on the Development of a New Accelerated Corrosion Test, by Walter L. Pinner.

Based on the report of the Advisory Committee on Accelerated Corrosion Tests, a program is described including plans for the fabrication, service exposure and accelerated corrosion testing of plated parts. Numerous accelerated test methods are described, which will be preliminarily examined for correlation with service exposure results. The objective of the project is to develop an accelerated corrosion test which will correlate with outdoor performance.

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CORRECTION

The acknowledgment following the article, "Statistical Quality Control—Watchdog of Ford Finishes," published in the May issue of PRODUCTS FINISHING, might be interpreted to indicate that Harmon S. Bayer developed statistical quality control techniques. While crediting Mr. Bayer with the development of the specific techniques covered in the article, it should be pointed out that W. A. Shewhart and others actually pioneered the development of statistical quality control.

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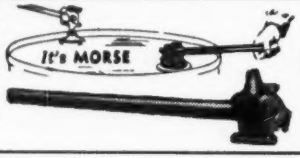
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



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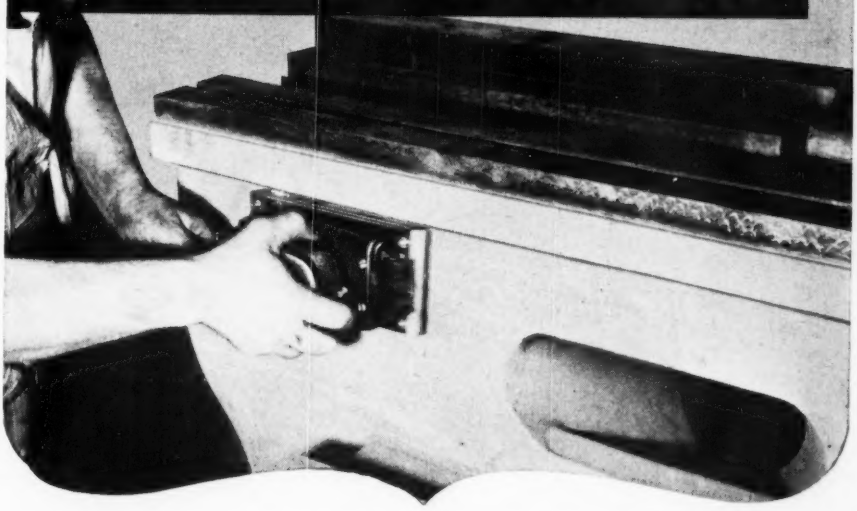
FAST, NEW METHOD FOR SANDING FILLER ON CASTINGS



Sundstrand *Straight-Line Action* Air Sander saves time...gives more uniform finish!

Here's the proven, *better* way to sand filler on castings. New Sundstrand Single Pad Air Sander gives a fast cut . . . quickly, evenly removes high spots . . . and because of its compact size and *straight-line action* gets into close quarters, up next to edges and moldings. Results in exceptionally fine finish . . . ideal for many other sanding operations on wood, metal, or plastics.

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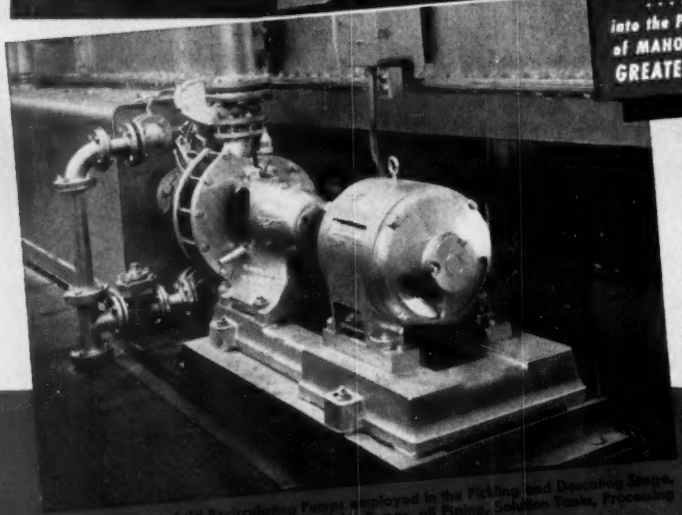

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Above is a general view of the Complete Mahon Steel Drum Finishing System in the U. S. Steel Products plant at Dolton, Ill. Upper right is the Mahon Finishing System in the U. S. Steel Products plant at Port Arthur, Texas. Similar Mahon installations including Metal Cleaning, Rust Proofing and Drying equipment were also installed in U. S. Steel Products plants at Sharon, Pennsylvania and Alameda, California.

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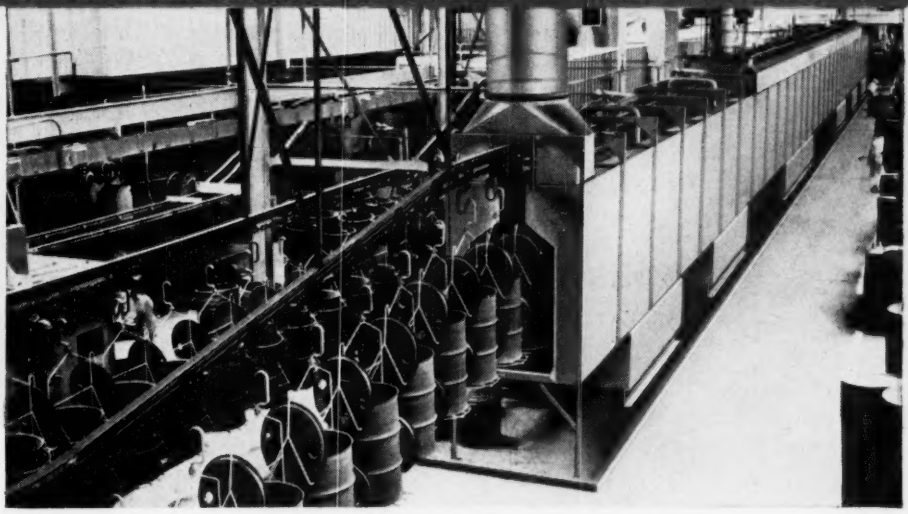

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Servel, Inc., Evansville, Indiana, is one of the many plants in this country which today is manufacturing military goods as well as its regular line of consumer items. Specifically, this company has set up one complete shop for producing cartridge cases for artillery ammunition. This article will relate the finishng operations for the 105 mm., M-32 cartridge case, pictured in the article heading, which is used in the 105 mm. Recoilless Rifle.

By FRANK L. BONEM

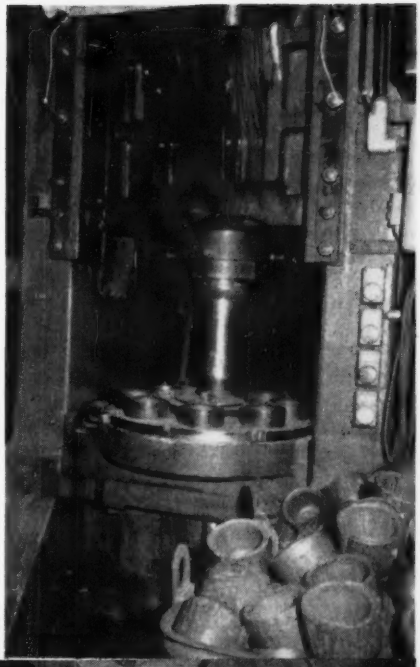
Manufacturing

ACTUAL manufacturing operations start with a ¾-inch thick circular metal disk, 9¾ inches in diameter, which is first formed into a cup. The cups go through a series of four draws, the first of which is pictured in Fig. 1. Between each of these drawing operations the cylinders are annealed, pickled in a solution of sulfuric acid, rinsed, sprayed with a soap solution and dried to facilitate the drawing of the cartridge case.

Pre-heading of case is accomplished before third draw, and trim to length follows third and fifth draws. After the final draw, the cartridge cases go to the header and then to a piercer, the latter piercing holes into the base for the primer. Next the cases are moved to a salt bath anneal where the mouths are annealed for the following tapering operation. After annealing and prior to tapering, cartridge cases are phosphatized and again soaped to facilitate metal forming and removal from the taper dies.

The last steps in the fabrication process consist of sizing the mouth, machining the head and piercing the many perforations in the case. This last operation, shown in Fig. 2, is accomplished on a battery of three Brickner Kropf perforators. After perforation, the cartridge cases are sand blasted on the inside to remove the burrs and then annealed for stress-relief and realigning of crystalline structure.

Fig. 1—The first draw in the manufacturing of the 105 mm. cartridge is accomplished on a rotating table draw press, made by The Cleveland Punch & Shear Manufacturing Company.



Prepaint Treatment

Prepaint processes are designed to produce a chemically clean, dry surface which will provide good adherence of a phenolic varnish. The treatment prior to painting conforms with Government Specifications JAN-C-490, Grade II, Type 5, and is completely accomplished in a Udylite full-automatic machine (see Fig. 3).

This machine is located in the same general area as the sand blaster and final anneal oven but immediately adjacent to the paint installation. The eleven stages in this machine are utilized as follows:

1. To remove the soluble oil used in reaming the primer hole, clean in hot alkaline solution having a concentration of 5 to 8 oz/gal. at 180 deg. F. for 4 minutes. The solution level in this tank is kept 2 inches below the over-flow gutter, and is replenished periodically to compensate for evaporation loss.

2. To remove the cleaner which did not drain off, rinse in hot water for 2 minutes. This tank is kept continually overflowing in order that the surface may be clear of foam.

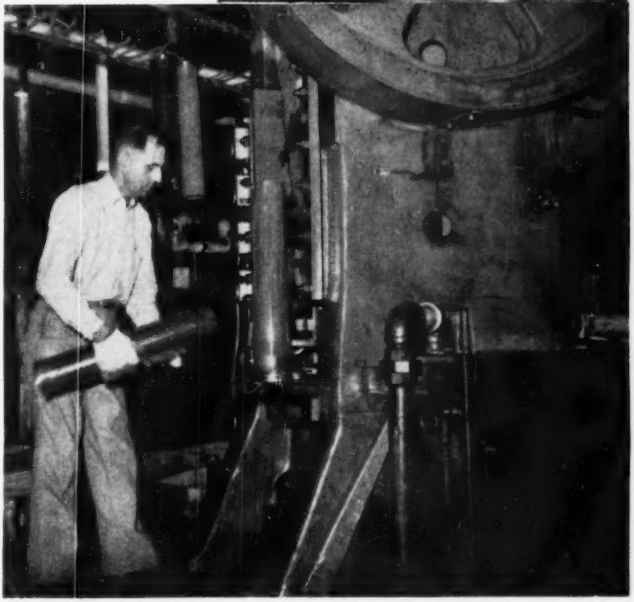


Fig. 2 — Cartridge cases for the recoilless rifle are perforated as the final step in manufacturing.

3. Pickle in warm (120 to 130 deg. F.) sulfuric acid solution, held at a concentration of 3 to 5 per cent, for 4 minutes. Solution level is high enough to cover all cartridge cases.

4. To prevent carry-over of acid into the next solution, rinse in overflowing cold water for 2 minutes.

5. Rinse in cold water for ½ minute. In this tank the water level is kept 3 inches below the kick bar.

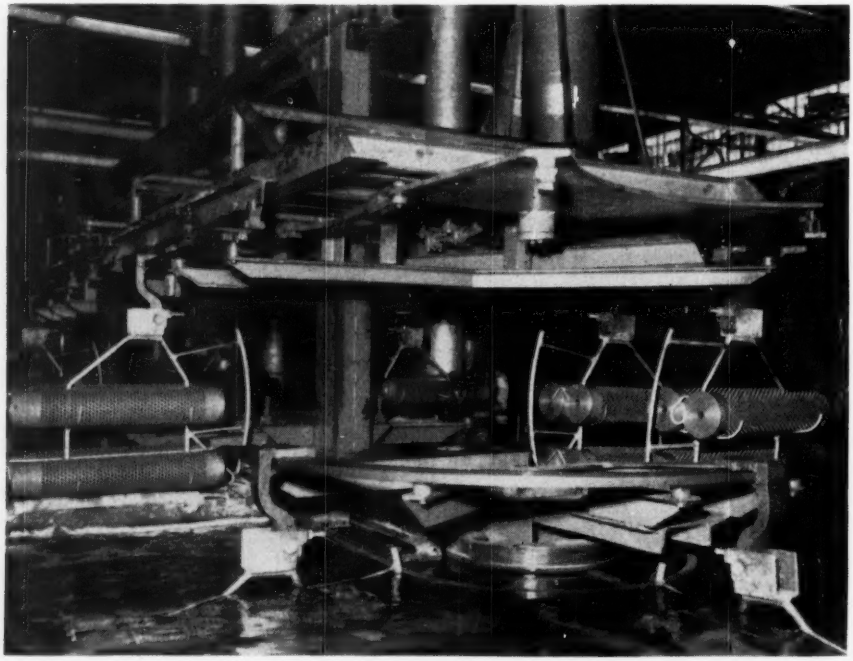
6. Rinse in overflowing cold water for 2 minutes.

7. To clean in phosphoric acid and deposit a very thin phosphate coating, pickle in Deoxidine 171 at a concentration of 15 to 20 per cent (by volume) and a temperature of 140 to 150 deg. F. for 4 minutes. Solution level in tank is 2 inches below the kick bars.

8. To wash off all phosphoric acid, rinse in overflowing tank of hot water for 2 minutes. This phase is critical since a foam, carried over from the previous tank, floats on top of the water. If this is picked up by the cases as they leave the rinse tank and carried into the next tank which contains warm chromic acid, a yellowish-white powder is formed. To prevent carry-over, two ¾-inch steam jet nozzles are used in addition to the fresh water supply lines, to roll the water over at the end of the tank from which the cases leave. These steam jets not only help general circulation in the tank, but also ensure that the cases emerge from the tank through clear water.

9. For neutralization and to prevent

Fig. 3—View of the 11-step, Udylite Full Automatic machine used for phosphatizing cases prior to painting.



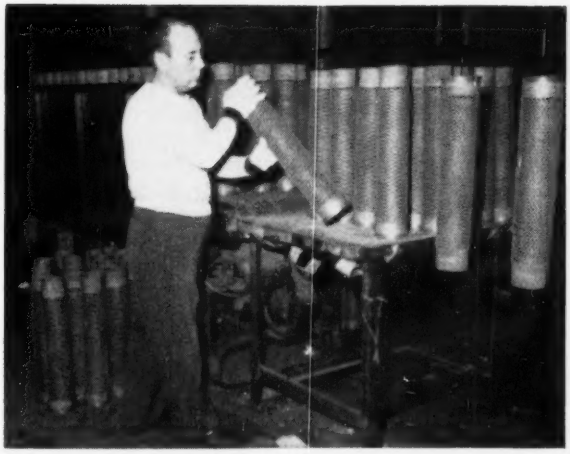


Fig. 4—View of the unloading end of the cooling conveyor which cools the cases so that the varnish coating may be applied at the proper temperature. A load bar of the paint conveyor may be seen in the right foreground.

rusting, rinse in a warm (140 to 150 deg. F.) chromic acid solution (Parcolene No. 1) for two minutes. This solution is held at a pH of 3 to 5.

10. For drying, the cases are held in a hot air stream for 8 minutes. A 5,000 c.f.m. New York blower is used to blow air over steam pipes, which heats it to 350 deg. F., and into the cases.

11. Load and unload.

Racks which are used in this machine are designed to carry four cartridge cases, and are constructed to facilitate easy drainage of the shells as they leave a tank. They are inspected by the operator who loads and unloads them, for loose or bent supports and excessive attack by the acids.

Tanks of this Udylite Automatic are Koroseal lined, except for the sulfuric acid tank which is lead lined and the Deoxidine 171 tank which is lined with stainless steel, and are heated by steam through Platecoils. These coils are made of steel with the exception that in the sulfuric acid and Deoxidine tanks, the coils are made of lead and stainless steel respectively.

Painting

After drying, the cartridge cases are unloaded and placed on a 10-ft. cooling conveyor, the unloading end of

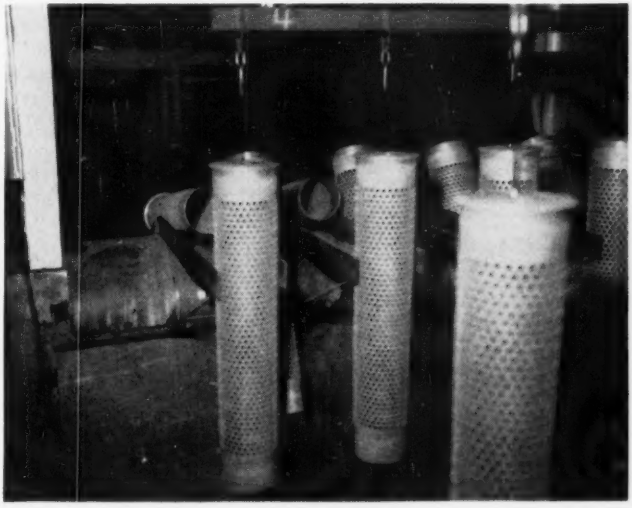


Fig. 5 — Shell cases, hung in staggered position from cross bars on the conveyor, enter the paint dip tank.

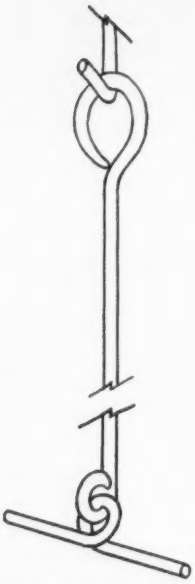


Fig. 6 — Drawing of the "Chinese Puzzle" Hook which is used to suspend the cartridge cases from the cross bars. Jostling of the cases while moving through the dip tank ensures the deposition of the coating on the small area of contact between each case and carrying hook.

which may be noted in Fig. 4. This conveyor connects the automatic phosphatizing machine to the paint conveyor and has a capacity of approximately 380 cases per hour. All cases are inspected by the person who transfers them to the paint conveyor.

Painting of the cases is accomplished with a dip tank setup. The paint conveyor, which moves at 2 f.p.m., carries cross bars from which the cases are hung. The cross bars carry five and six cartridge cases alternately in a staggered pattern, and as the cases approach the dip tank, they automatically enter channels of steel rails which run through the dip tank and may be noted in Fig. 5.

This arrangement of staggered cases and channels in the paint dip tank allows more efficient spacing and nesting as the cases are dragged horizontally through the dip tank. Also, a shallower dip tank can therefore be used, thus reducing varnish waste.

Of considerable interest is the method of support used to hang the cases from the cross bars. This presented a problem because the varnish has to be applied all over and most of the common methods would therefore require two passes through the dip tank. The solution was in the use of a "Chinese puzzle" hook which was modified by Ransburg engineers for use with these cases (see Fig. 6). These hooks which are clean and simple, are fed through the primer hole and support the cases

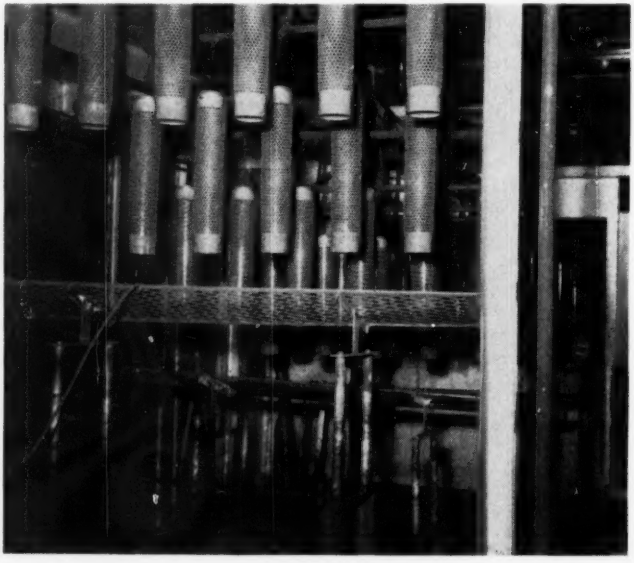


Fig. 7—The three detearing screens located below the cartridge case conveyor, attract excess paint particles electrostatically, thus preventing ragged edges. The cases are ascending on the conveyor to the preheat oven, located above the dip tank.

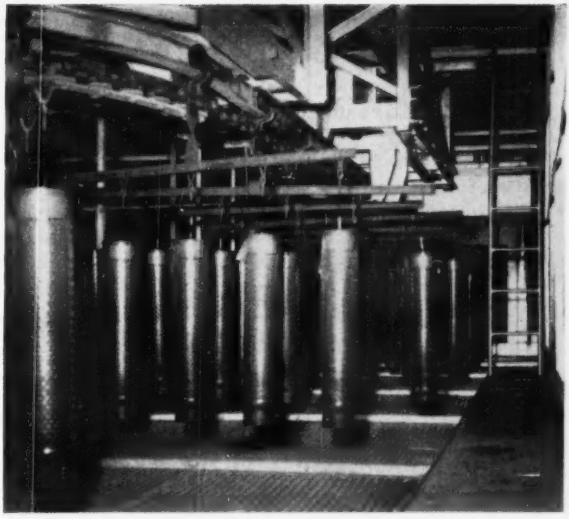


Fig. 8 — Cartridge cases emerge from the bake oven (rear) installed above the dip tank. The conveyor then makes a U-turn and dips down to floor level where it is unloaded, immediately prior to the loading station shown in Fig. 4. The unloaded cases are placed on the inspection conveyor which runs parallel to the paint conveyor at this point.

(All photos by PRODUCTS FINISHING)

upside down. They cannot be dislodged from the case till it is removed from the conveyor, when they drop out through the mouth of the case.

The dip tank was designed by Charles T. Boyer, Servel process engineer, and constructed and installed by George Koch Sons, Inc. The varnish, as noted previously, is of the phenolic baking type, meets Specification 3-221 and is made by Jones Dabney. It is used at a viscosity of 13 to 14 seconds on the No. 4 Ford Cup. A varnish film thickness of from 0.6 to 1 mil is deposited.

Immediately behind the dip tank and in the same enclosure are three Ransburg electrostatic detearing screens, one of which may be seen in the foreground and two in the rear of Fig. 7. These units pull off the beads of paint which form along the lower edge, and therefore assure an even coating of paint over the cartridge case surface.

While passing over the detearing screens, the conveyor begins its ascent to a higher level on which the bake ovens are located, directly above the painting installation. Cases first travel through a preheat oven for 15 minutes and then through the bake oven for 45 minutes. Temperature in the preheat oven is 150 deg. F.; in the bake oven 375 deg. F.

Each of the two ovens, also designed and installed by George Koch Sons, Inc., has its own heating system.

The ovens are direct fired with gas and have nozzle type duct work. The oven temperatures are controlled automatically and both units are equipped with safety devices.

Emerging from the bake oven (see Fig. 8) the cases are conveyed to the main floor where they are removed from the conveyor just before they reach the loading station. Cases are then inspected and readied for shipment.

Solution Maintenance and Inspection

Very close control of the solutions used in cleaning and preparation for painting is maintained. The alkali cleaning solution, the first step in paint pretreatment, is analyzed once each shift and the solution level is checked every two hours. Regardless of the concentration, the tank is dumped and recharged whenever an oily layer spreads over the solution surface.

The rinse tank immediately following the alkaline cleaner tank is dumped and refilled every day after the second shift. Instructions call for the dumping of this tank at every available opportunity.

The sulfuric acid pickle is analyzed each shift and an iron analysis is run every two days. The pickle solution is changed when the iron content exceeds 8 per cent. The three cold water rinses which follow the pickle are changed every day.

The Deoxidine solution is analyzed once per shift but cannot be changed without checking with the Processing Department. The hot water rinse tank which follows is changed every day, or more frequently if possible.

The pH of the warm chromic acid rinse is checked every three hours with pH paper. An analysis for free and total acid is made once each shift. The solution is dumped and made up fresh every day and, time permitting, each shift.

The cases are given a 100 per cent inspection after pretreatment and again after final varnish baking. Due to the rigid solution control, and the design of the finishing setup, the plant's efficiency is extremely high; less than 1 per cent rejects is considered normal.

ACKNOWLEDGMENT

The author acknowledges with sincere thanks the assistance and cooperation of A. H. Counts, superintendent of cartridge case production, and John Bilderback, process engineer, in securing information contained in this article.

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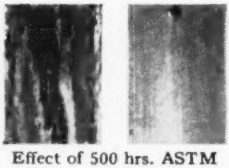
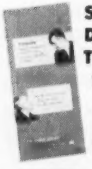


Effect of 500 hrs. ASTM salt spray on oleoresinous paint over bare steel (left); and same paint over Vinsynite (right).



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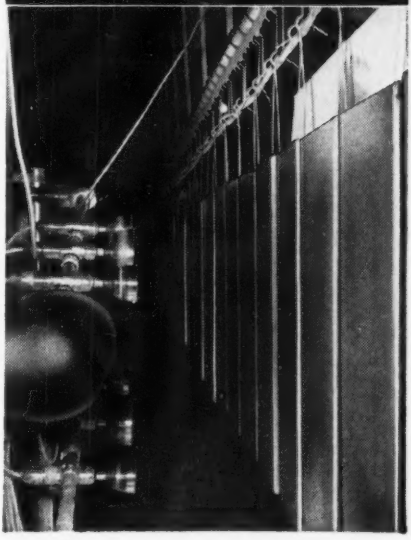

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Spotlighting FINISHING Progress

IT is a privilege and great pleasure to announce to the readers of PRODUCTS FINISHING that Dr. C. Fred Gurnham, Head of the Department of Chemical Engineering, Michigan State College, will serve as one of the Contributing Editors of "Spotlighting Finishing Progress."

Dr. Gurnham received a B. S. degree in Chemical Engineering from Yale University, and the degrees of M. Ch. E. and D. Eng. Sc. from New York University. His experience includes fifteen years in industry as a chemical engineer, and seven years in the field of education in which he is presently engaged. For four years he was Head of the Department of Chemical Engineering at Tufts College, Boston, and now has a similar assignment at Michigan State.

Presently a member of the Jackson - Lansing Branch, former member of the Boston Branch, and past president of the New Haven Branch, Dr. Gurnham has long been active in the American Electroplaters' Society, and has been particularly interested in its research activities. He was the originator and first chairman of A.E.S. Research Project No. 10 on the Treatment and Disposal of Electroplating Wastes, and former vice chairman of the Research Directing Committee in charge of Projects No. 2, 6, and 10.

Professor Gurnham is a member of the American Chemical Society, American Institute of Chemical Engineers, National Society of Professional Engineers, Michigan Sewage and Industrial Wastes Association, and the National Technical Task Committee on Industrial Wastes (delegate from the Electroplating Industry).

By Dr. C. Fred Gurnham, Head, Dept. of Chemical Engineering, Michigan State College

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

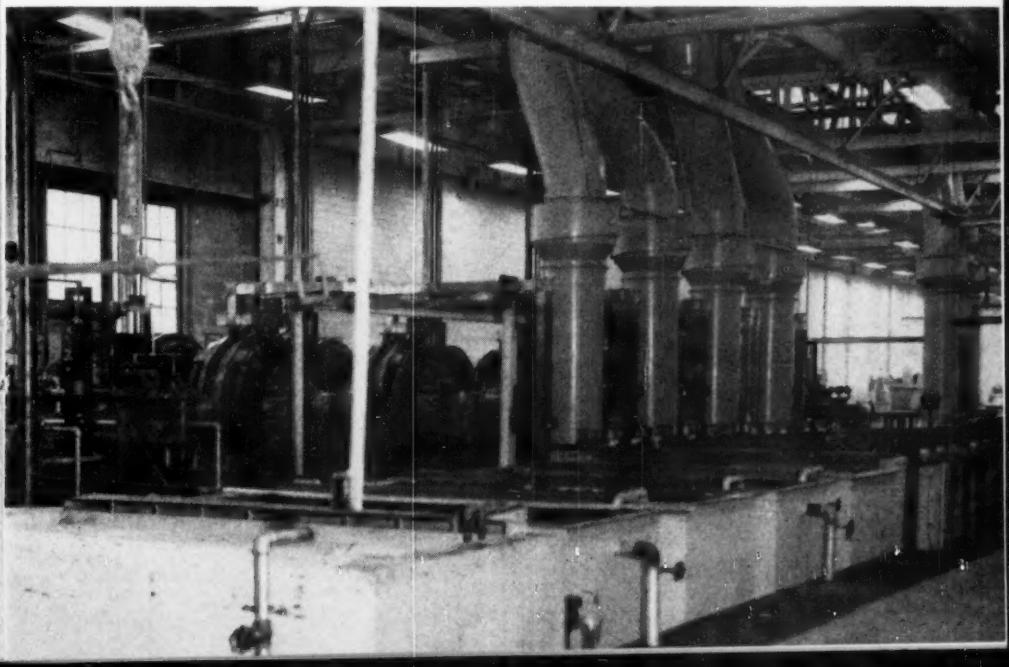
The Significance of Air Velocity in Ventilation Design

ADEQUATE ventilation is generally recognized today as an important part of finishing-room engineering. This has not always been the case, but it is becoming increasingly more important for two principal reasons: first, the industrial hygiene viewpoint, which recognizes the hazard to operating personnel from certain of the gases and fumes from plating tanks or spray booths, and, second, the industrial relations viewpoint, which is concerned with unpleasant operating conditions from objectionable smells, clouds of steam, or dusty atmosphere. The subject of plating-room ventilation was discussed at the Second Annual Industrial Ventilation Conference and Workshop held during February at Michigan State College, under the cooperation of the Division of Industrial Health of the Michigan Department of Health, and the Department of Mechanical Engineering of the College. Some of the highlights of that Conference will be discussed briefly in this paper, which is based in large part on a talk and discussion led by Jack Baliff of the New York State Department of Labor, Division of Industrial Hygiene and Safety Standards. The "textbook" used in this Conference and Workshop was "Industrial Ventilation: A Manual of Recommended Practice," published by the Committee on Industrial Ventilation of the American Conference of Governmental Industrial Hygienists.*

The most important single factor in the design of a ventilation system for plating tanks, spray booths, ovens, or for other units which are ventilated by

* Available from the Committee offices, P. O. Box 453, Lansing 2, Michigan, at a price of $3.00.

Fig. 1—View of a chromium plating installation. Fumes from the chromium plating tanks proper are drawn off into ducts located along each side of each tank and removed from the plant through the vertical ducts shown in the background of this photograph. The exhaust ducts are equipped with water jets so that the inner walls of the ducts may be washed down periodically.
(*PRODUCTS FINISHING Staff Photo*)



the principle of exhausting the air, is the weight or volume of air moved. Many ventilation units are designed on the basis of air velocity at the edge of the plating tank (see Fig. 1) or at the intake slot to the duct system, but velocity is no longer believed to be as important as the quantity of air moved. In considering flow through a duct or a slot, there is a simple ratio or relation between the velocity and the volume of air moved; but in an open area, the relation is not so simple, and volume of air is a more usable unit. Even though velocity itself is not of primary importance for ventilation control, it still has engineering and economic considerations which are discussed in Mr. Baliff's paper and which we shall review here.

Velocity has the fundamental units of distance divided by time, and, in ventilation work, is usually expressed in feet per minute (f.p.m.). A basic relationship of primary importance in all ventilation work is the concept that velocity multiplied by area is equal to volume rate of flow:

$$Q = A \times V$$

The application of this equation to an enclosed air stream, such as exists in a ventilation duct, is quite simple. If **A** is the area or cross-section of the duct (in square feet) and **V** the average velocity of the air in the duct (in feet per minute), the product **(A x V)** or **Q** is the volume rate of flow in cubic feet per minute.

$$(ft^2) \times \left(\frac{ft}{min}\right) = \left(\frac{ft^3}{min}\right)$$

This formula is equally applicable to air flow in an open space or room; for example, if an imaginary envelope of any size whatever is considered to surround the intake to a ventilation duct, the total area of this envelope multiplied by the average velocity of the air crossing the envelope and perpen-

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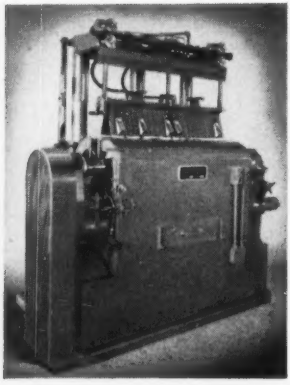

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dicular to it is equal to the total volume rate of air flow. We shall have more to say about this relationship later on, with particular reference to plating tank ventilation.

Another velocity formula in common use is:

$$V = \sqrt{2\,g\,h}$$

in which **h** is the head or pressure difference which is required to cause flow at the velocity **V**, and **g** is the gravitational constant. Using self-consistent units in the foot-minute system, this equation serves to relate velocity, **V**, in feet per minute, to pressure drop, **h**, measured in feet of head of the fluid flowing (i.e., in feet of head of air, or approximately $\frac{830}{12}$ x inches of water pressure), and **g**, in feet per minute per minute ($g = 32.2 \times 3600$, or 116,000, in these units). In ventilation work, it is necessary to write this equation in the following forms:

$$V = 4005\sqrt{p}, \text{ or}$$

$$p = \left(\frac{V}{4005}\right)^2,$$

where **p** is the pressure drop in inches of water. From these equations, it will be noted that the velocity of the air varies as the square root of the pressure. Conversely, in order to double the air velocity, four times as much pressure (or suction) must be provided. Since high pressures may call for special designs of fans or blowers, and always require more power consumption at the blower, it is obvious that the economic considerations indicate as low a velocity as is satisfactory for the ventilation task.

Another formula which should be understood is as follows:

$$hf = f\left(\frac{L}{D}\right)\left(\frac{V^2}{2g}\right).$$

This equation indicates the head or pressure loss in a pipe system due to

MACHINE
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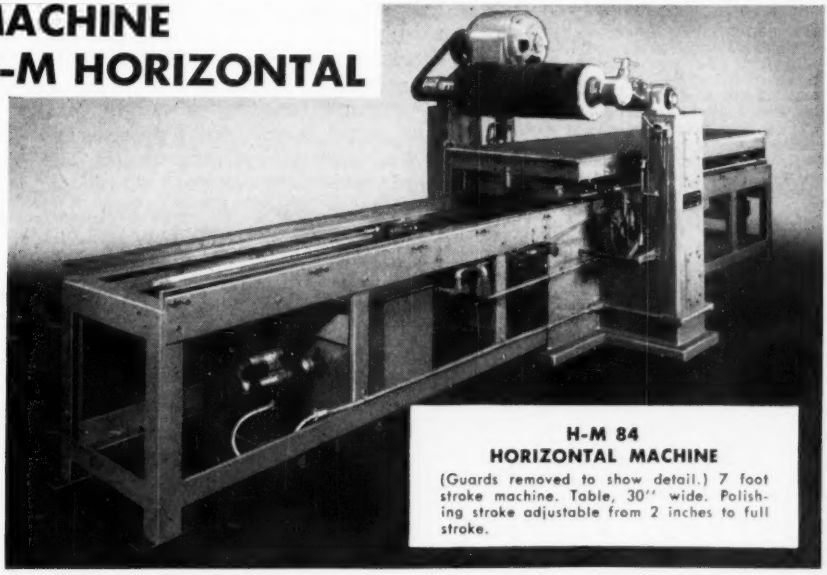

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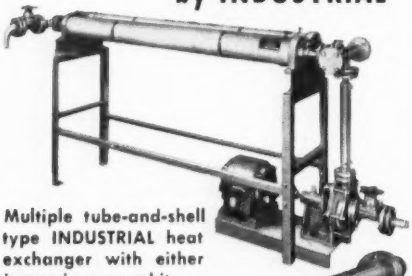

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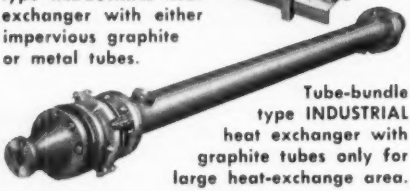

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friction, such loss being proportional to **f**, a fraction factor which depends on the nature of the pipe interior, being low for smooth surfaces and higher as the roughness increases. The friction loss is also proportional to $(\frac{L}{D})$, which is the ratio of pipe length to pipe diameter; it being apparent that the longer the pipe, the greater the pressure drop, and also, the smaller the diameter, the greater the pressure drop. This equation, like the previous ones, indicates that the pressure drop in a pipe or duct varies as the square of the velocity.

Control Velocities

The velocity of the air which is drawn into a spray booth or over the surface of a plating tank should be sufficient to stop and turn back any particles or droplets which have a tendency to escape from the booth or plating tank into the atmosphere of the room. The air velocity required for this purpose is called the control or capture velocity. An efficiency of one hundred per cent is not always necessary, as there is usually no objection to a small quantity of non-harmful dust or fume escaping into the room. If the contaminant is toxic, the efficiency should be as close to 100 per cent as possible. In collecting dust from grinding and similar operations, lower efficiency is certainly permissible, because the particles which escape into the room are the large, heavy particles; these settle quickly to the floor and do not remain in the atmosphere as dust.

The capture velocity must also take into account the initial velocity of the escaping particles, especially if these particles are large and heavy. If the particle which is to be controlled has an appreciable velocity and energy, the air stream must be moving rapidly enough and must be of sufficient depth to slow up, stop, and turn back this

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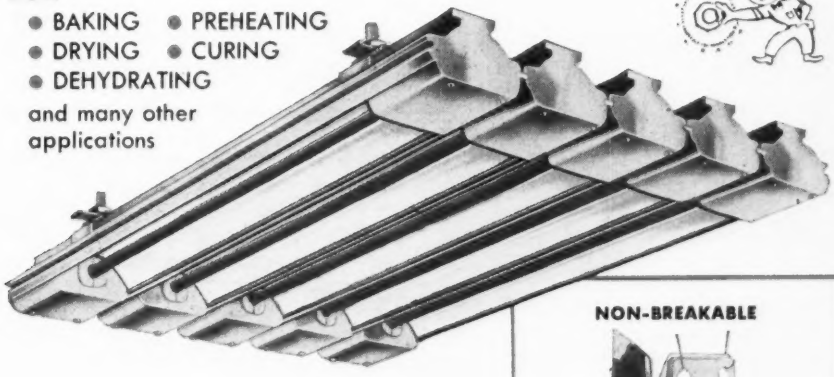

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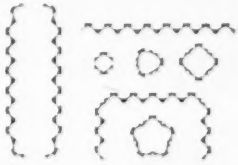

Cross-section views of a few of the many oven designs possible with Chromalox Radiant Heaters.

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particle. The moving air can be regarded as a wall designed to stop the contaminant particles; a high-velocity air stream is like a strong steel wall, while a low-velocity stream resembles a weak paper wall, and a good depth of the moving air curtain may be regarded as a thick wall. Thus a flying particle might be able to pass through even a high-velocity air curtain if there were no appreciable depth to the curtain, but would be slowed up and stopped by a slowly moving air current in sufficient depth.

From the viewpoint of practical industrial hygiene, it is not necessary to control dust particles of large size. Particles greater than 10 microns (10 thousandths of a millimeter, or 10/25,000 inch) in diameter are not usually considered objectionable because they do not remain in the air after they have escaped, but settle rapidly to the floor. Good housekeeping will prevent such particles from being ground underfoot. Alternatively, they may be removed from the room at floor level by suction ducts in that region.

A practical example of the use of deep air curtains is in the design of spray booths, which should be made as deep as possible, with the work or source of air pollution well inside the entrance. With deep spray booths, control velocities of 100 feet per minute are adequate, while with shallow working spaces, double this velocity (and four times the blower suction) is necessary.

The control velocity required for different operations varies from as little as 50 to as much as 2000 feet per minute. Since the whole ventilation system design is based on providing and maintaining this control velocity, the selection must be based on as complete a knowledge as possible of the process operation, the particle sizes,

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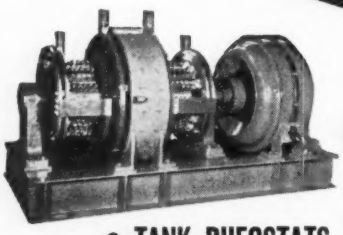

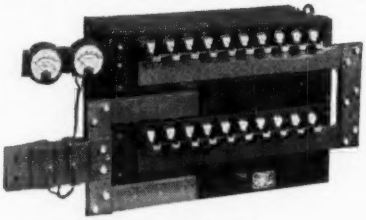

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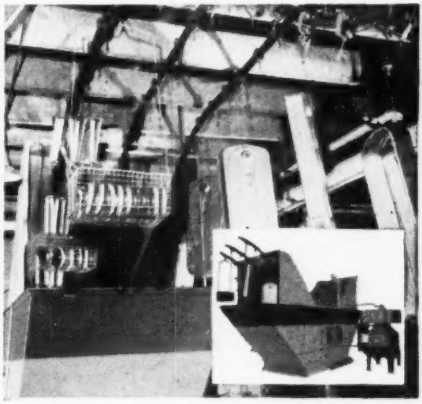

Parts emerge from degreaser on three separate conveyor lines ready for the next operation. Inset shows degreaser complete with solvent recovery still.

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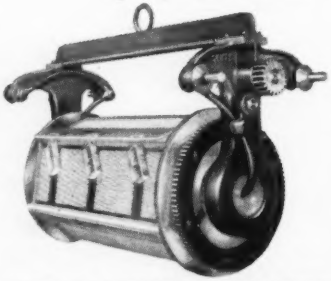

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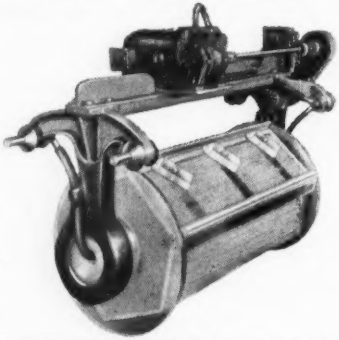

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the initial velocity of the particles, the influence of external air currents, and the design of the ventilation hood, as well as of the toxicity or nuisance qualities of the contaminant which is to be controlled. The manual referred to earlier presents a table of suggested capture velocities, based on four rather broad categories of condition of dispersion of contaminant. Considerable judgment is desirable in the use of this table, and such judgment is acquired only by experience; the table is, however, a valuable aid to the inexperienced designer or maintenance man also. A brief discussion of these various categories follows.

Category A is that in which the contaminant is released with no velocity into quiet air; capture velocity is 50 to 100 f.p.m. This is a condition which appears to be more theoretical than real, since if a particle is released with no velocity it is effectively not released at all. An object moving with zero velocity stays where it is. Truly quiet air also is a non-existent condition, and in most workshops, including plating rooms, the air velocity due to random currents is usually of the order of 50 feet per minute or more. A person walking past a plating tank stirs up air currents of greater velocity than this. The design velocity for control should therefore be the sum of the capture velocity as given in this table and the velocity of normal or anticipated local air currents in the room.

With due allowance for random air currents in the surrounding atmosphere, many plating room operations fall in this category or close to it, although the upper control velocity of 100 f.p.m. should usually be chosen. Evaporation at room temperature is an example of the release of contaminant at substantially no velocity, and might be illustrated by the fumes coming from a muriatic acid dip which is standing quietly. In most plating or pickling operations, gassing occurs,

to page 96→

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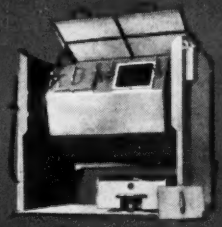

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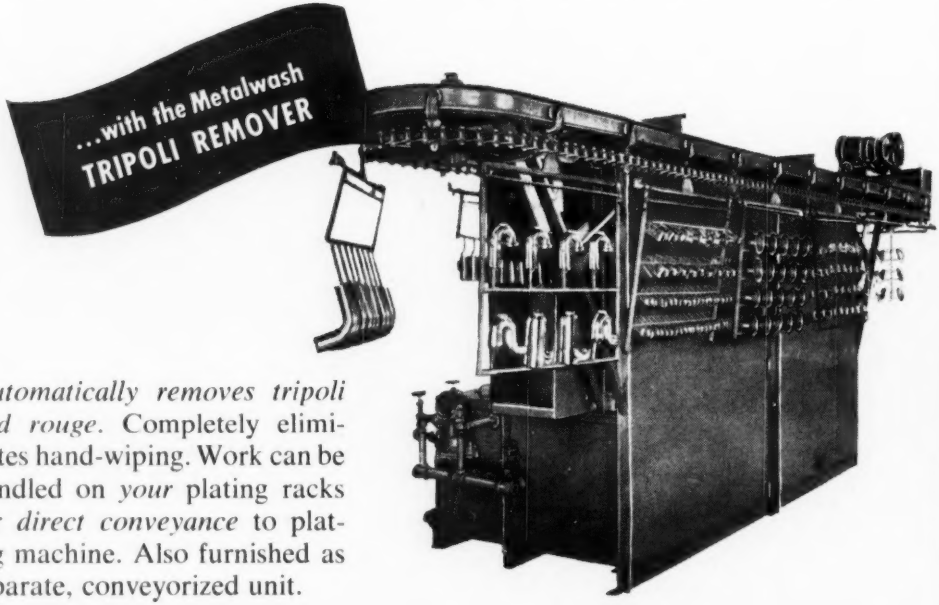

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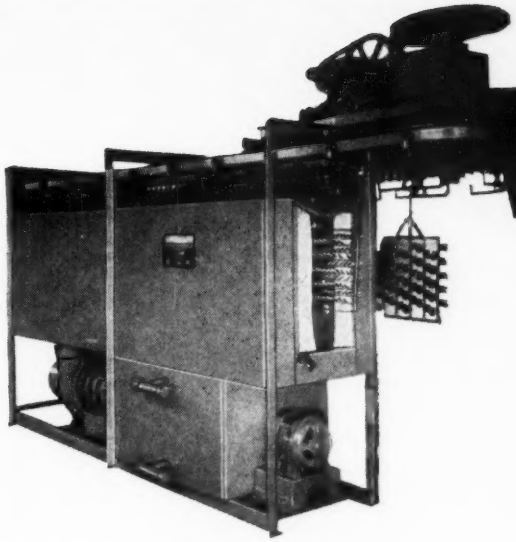

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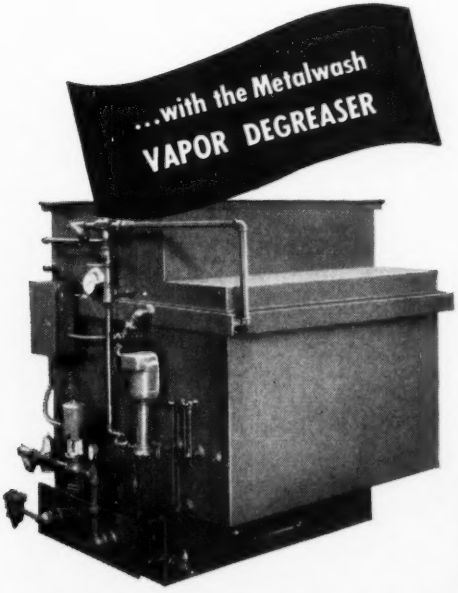

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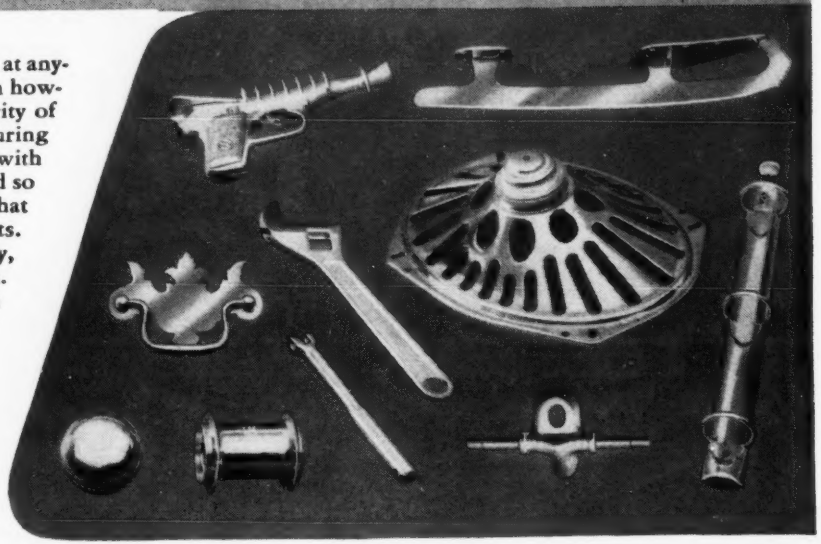

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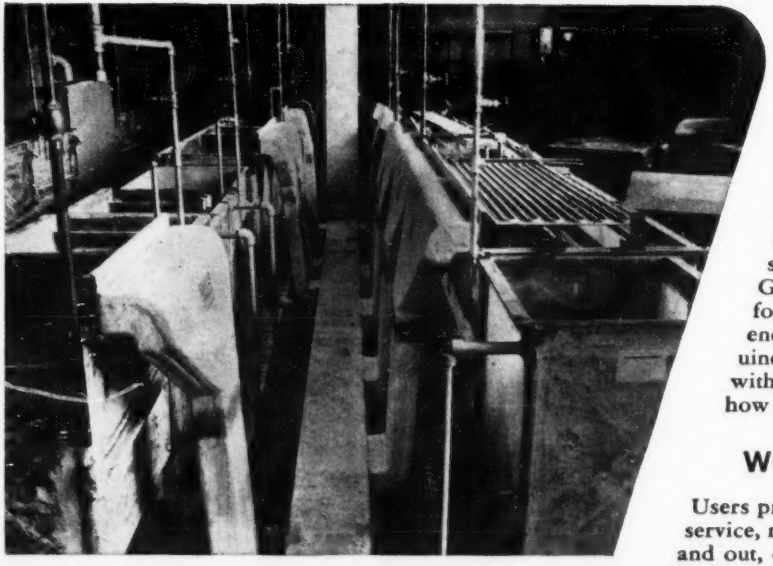

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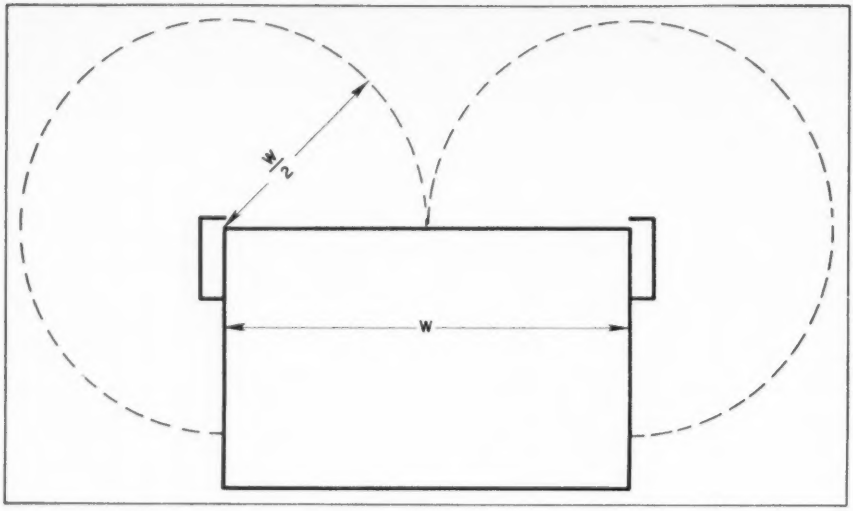

Figure 2

and the release of these gas bubbles from the surface of the liquid throws droplets of solution into the air with an appreciable velocity. Under such conditions, the higher value of control velocity (100 f.p.m.) should certainly be used rather than the lower; or the problem should be classified in the next category. A properly designed solvent degreaser prevents the escape of vapors with any substantial velocity, although the effect of air currents in the room may be considerable.

Category B is that in which the contaminant is released at low velocity into moderately still air; capture velocity is 100 to 200 f.p.m. This category includes evaporation with boiling or at high temperatures, and vigorous gassing from solutions. The designer's choice of capture velocity, within this range, is based on room conditions and type of ventilation hood provided.

Category C is that in which the contaminant is actively generated into the zone of rapid air motion; capture velocity is 200 to 500 f.p.m. The principal example of this category in the metal finishing plant is spray painting in shallow booths. In deeper booths, the rapid particle or droplet motion is dissipated within the booth, and control velocity at the booth opening can be substantially lower, as in the previous category.

Category D is that in which the contaminant is released at high initial velocity into a zone of very rapid air motion; capture velocity is 500 to 2000 f.p.m. This group includes grinding operations, abrasive blasting, and tumbling. The particles released from a grinding wheel are obviously moving at a high velocity, and their capture requires the relatively high control velocity indicated for this category, as well as an appreciable depth of air current. If the particle velocities are not random but are directed fairly uniformly, proper hood location can take advantage of this motion; this is seen on many grinding hoods where the contaminant particles are discharged by their own motion into the

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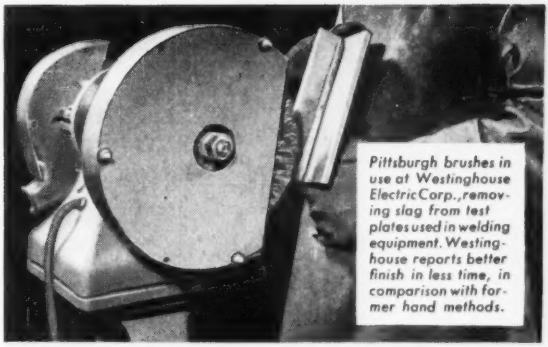

Pittsburgh brushes in use at Westinghouse Electric Corp., removing slag from test plates used in welding equipment. Westinghouse reports better finish in less time, in comparison with former hand methods.

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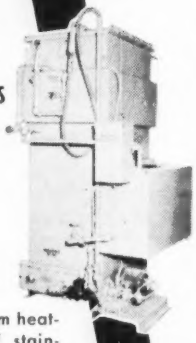

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polishing hood opening.

Air requirements for plating tanks are frequently expressed in cubic feet of air per minute per square foot of tank surface. This is a different concept from the capture velocity which we are discussing, although both concepts have the basic dimensions of feet per minute, or cubic feet per minute per square foot. Velocity is based on the square feet of cross-sectional area of the flow channel itself, for example, of the duct or slot. In general, the c.f.m. per square foot figure is higher than the capture velocity in f.p.m. The two concepts are illustrated by the idealized sketch of Fig. 2, which shows the cross-section of a plating tank of width W, with ventilation slots along both sides. It is reasonable to assume that all or most of the air entering these slots passes first through the envelope shown as a dotted line in the figure. While this is not entirely correct, it is near enough so for this analysis. The periphery of the three-quarter circle over each slot, based on a radius equal to $\frac{W}{2}$, is equal to $\frac{3}{4}(2 \times \pi \times \frac{W}{2})$. If the tank length is equal to L, the total area of the two envelopes is then: $2 \times \frac{3}{4} \times 2 \times \pi \times \frac{W}{2} \times L$, which is equal to 1.5π W L. For a control velocity of 50 feet per minute, and since $Q = AV$, $Q = 50 \times 1.5 \times \pi \times W \times L = 235WL$. Since WL is equal to the tank area, it may be noted that the flow requirement is 235 c.f.m. per square foot of tank area, and that this provides a capture velocity at the center of the tank of 50 f.p.m.

Applications of Control Velocity

In an enclosing hood which nearly surrounds the working area, it is easy to understand the concept of control velocity as it applies to the hood open-

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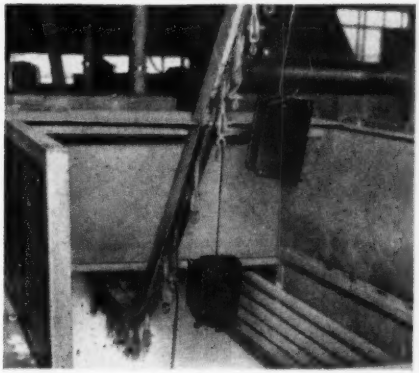

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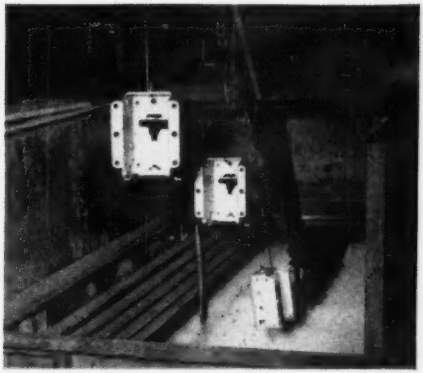

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ings. The velocity inward through the openings should exceed the escaping velocity of the particles which are to be controlled. In actual practice, a substantial margin of safety or over-design is usually employed, since the total area of openings into an enclosing hood is apt to be small. In a spray booth, velocities through the opening of 100 to 200 feet per minute are usually sufficient to control the overspray and the solvent vapors from the operation. The higher velocity is needed for shallow booths for two principal reasons: first, because the air acts on the flying particles for a shorter time, and second, because the opening is more exposed to air currents in the room.

In canopy hoods, of the type illustrated in Fig. 3, the design problem is much more difficult, since air flows into this hood from all sides. Furthermore, the horizontal velocity is greatest at the hood and least at the working level where it is needed. To allow for this unequal velocity distribution, a factor of 1.4 is commonly recommended. That is, the average flow within the vertical distance from the work to the hood rim is planned to be 1.4 times the capture velocity needed

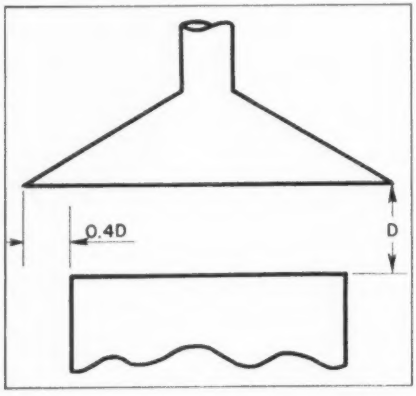

Figure 3

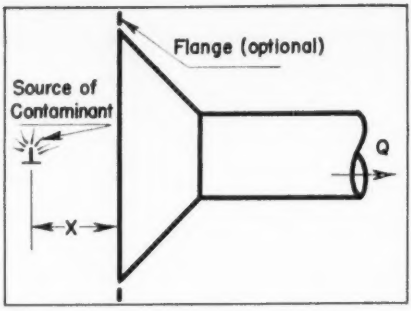

Figure 4

at the working table or tank surface. This formula is sometimes expressed as:

$$Q = 1.4\,P\,D\,V,$$

in which **P** is the perimeter of the tank in feet, **D** is the vertical distance from the tank to the hood rim in feet, and **V** is the capture velocity wanted at the tank level in feet per minute. A hood of this type is greatly improved by the installation of side curtains on as many sides as possible, thereby creating a semi-booth or booth. Canopy hoods are not suitable for toxic materials or for heavy vapors which have a tendency to roll over the side of the tank and down to the floor; they are also not suitable if the worker must bend over the working area, because in that case he would be working in and breathing the contaminated air stream. Canopies are most suitable for steam and vapors which have a natural tendency to rise, and for other harmless materials.

Free-hanging hoods, as illustrated in Fig. 4, are not particularly desirable as ventilation units, but they are sometimes employed. A free-hanging hood may be pictured as merely an open end on an exhaust hood; sometimes with the addition of a flare (as pictured) or a flange (as shown by a dotted line at the edge of the flare). Air enters such a hood from all sides as

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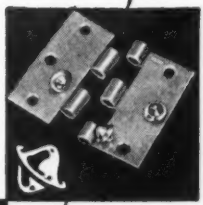

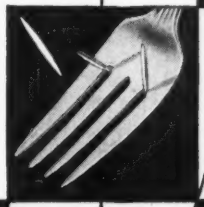

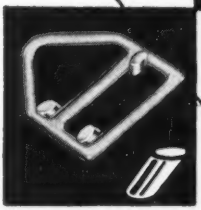

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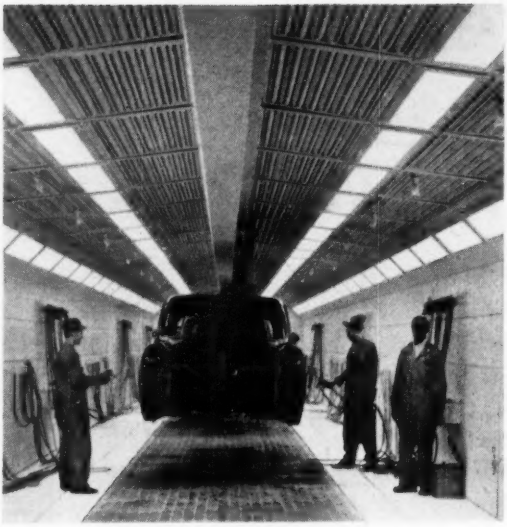
Fig. 6—A typical down draft Hydro Filter spray booth especially designed for automobile body finishing.
(Photo courtesy The R. C. Mahon Co., Detroit 34, Michigan)

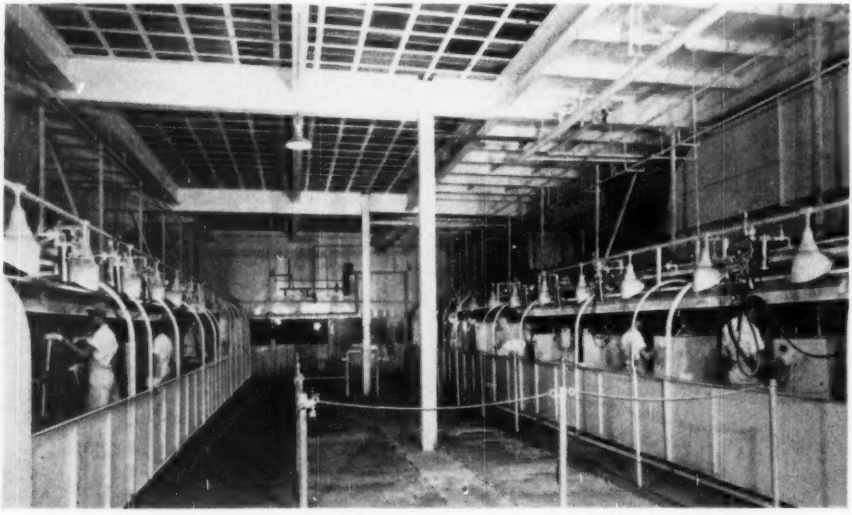


well as the front, and hence the efficiency is very poor except for contaminants generated directly in front of and close to the opening. The Dalla Valle formula for free hanging hoods is:

$$\mathbf{Q = V\ (10X^2 + A)}$$

in which **X** is the distance in feet from the face of the hood to the source of contaminant, **A** is the area of the hood in square feet, and **V** is the required control velocity. It can be seen from this equation that the quantity of air required for a given control velocity increases very rapidly as the source of contamination is moved farther

Fig. 5—Engineering solutions of ventilation problems result in plant installations such as this group of Mahon Hydro Filter spray booths installed in the Maytag plant. In this spray room synthetic enamel is applied. Diffusers for the filtered air supply system are mounted in the ceiling.
(Photo courtesy The R. C. Mahon Co., Detroit 34, Michigan)



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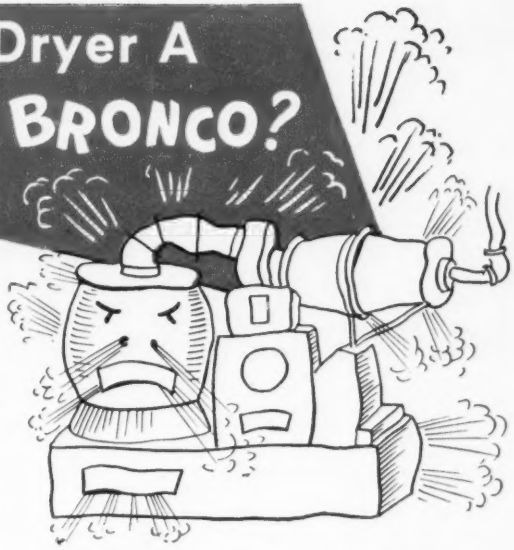

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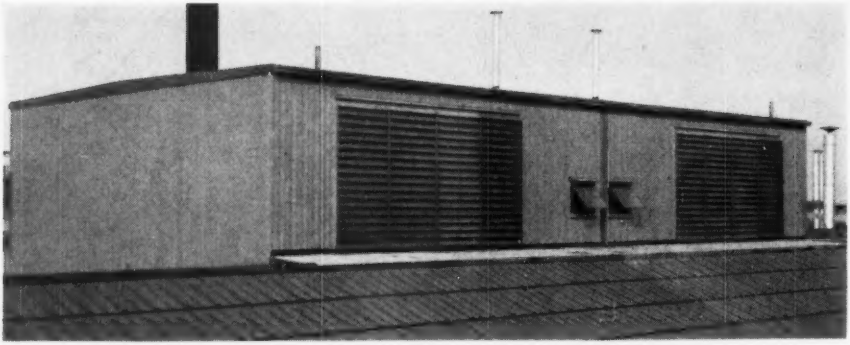

Fig. 7—Modern finishing systems are designed to supply clean filtered air to spray booths in which lacquers or enamels are applied. This view shows a typical air supply housing which contains filters, air washers, air heaters and blowers, to process incoming air and deliver it to the spray area.

(Photo courtesy The R. C. Mahon Co., Detroit 34, Michigan)

from the duct opening. A 25 per cent improvement is effected by providing flanges at the duct opening, as illustrated by the dotted line in Fig. 4. The equation, in this case, may be written as:

$$\mathbf{Q = 0.75\ V\ (10X^2 + A).}$$

The flange width need not be greater than six inches to obtain this gain.

Slot Velocities

Plating tanks are commonly ventilated by an exhaust slot along one or both of the opposite sides. Slot velocities in the order of 2000 f.p.m. have been recommended for good control, but the necessity for such high velocities has been disproved. Control is a function of the total

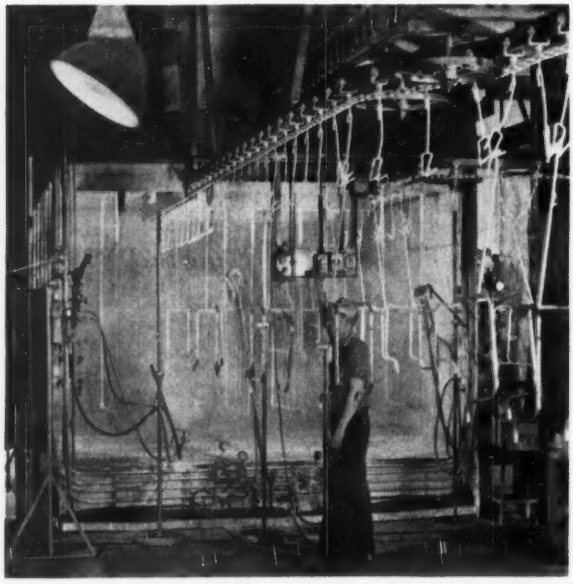

Fig. 8—Ventilation problems of an entirely different character are encountered in designing spray booths for electrostatic paint application. The installation shown is in the plant of the Buntting Glider Co., Philadelphia, Pa.

(Photo courtesy Despatch Oven Co., Minneapolis 14, Minnesota)

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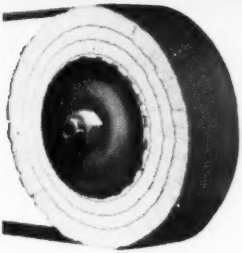

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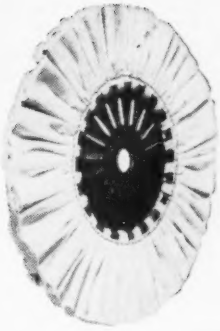

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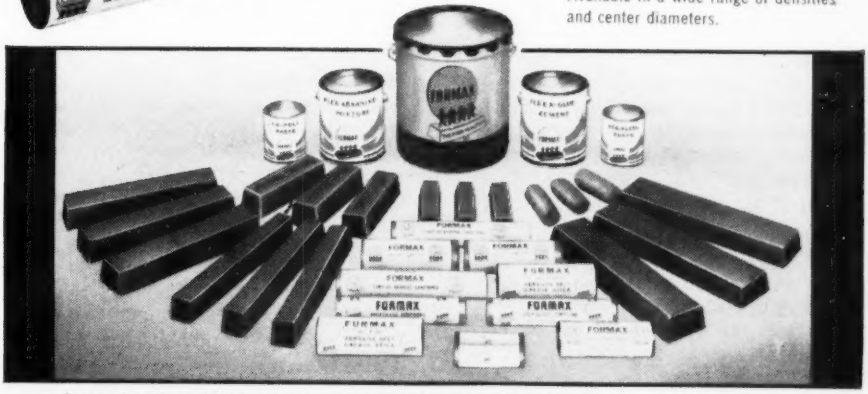

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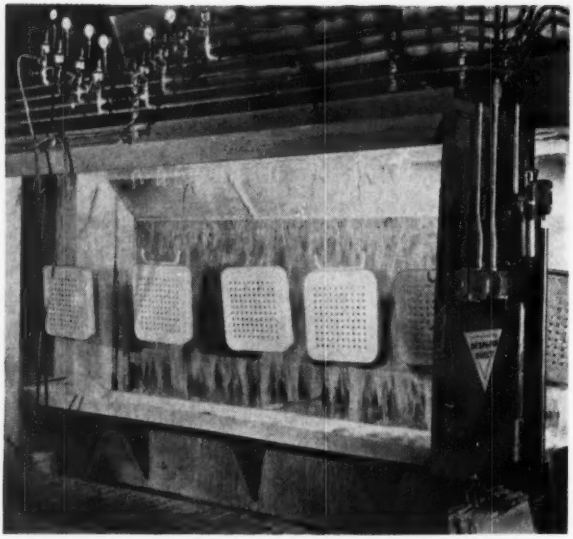

Fig. 9—Ventilation problems concerned with the design of manual type water wash spray booths include factors not found in other types of installations. The booth shown is a 12-foot spray booth installed in the plant of the Buntting Glider Co., Philadelphia, Pa.

(Photo courtesy Despatch Oven Co., Minneapolis 14, Minnesota)

volume of air exhausted, and if good distribution across the surface of the tank can be achieved, slot velocities as low as 300 f.p.m. may be entirely acceptable. If uniform distribution is not possible the higher velocities are required in order to obtain the desired capture velocity at the minimum points. High slot velocities, of course, result in higher resistance losses and, therefore, higher power costs at the blower.

The engineering design necessary to provide uniform velocity distribution across a tank surface is still partly art and judgment, as well as science. Success is largely dependent on the skill of the fabricator of the ducts and slots. To meet this requirement of uniform flow, the designer may utilize tapered ducts, fishtail distributors, and slots of varying width, as well as baffles

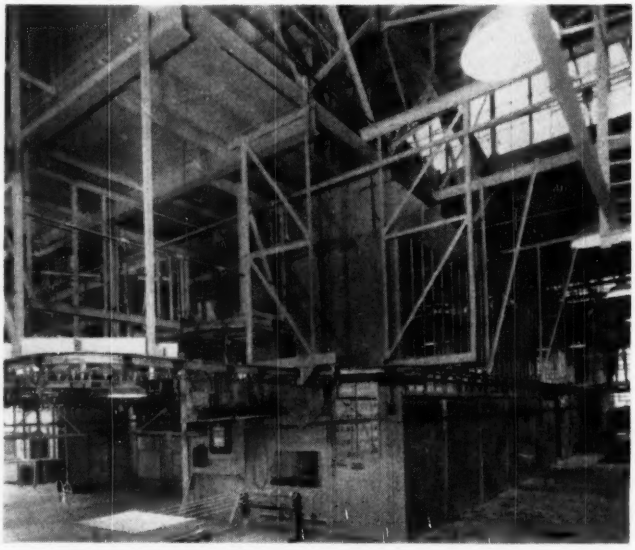

Fig. 10 — View of a porcelain enamel spraying installation including spray booth, cable conveyor, air replacement system, and operator room enclosure.

(Photo courtesy George Koch Sons, Inc., Evansville 4, Indiana.)

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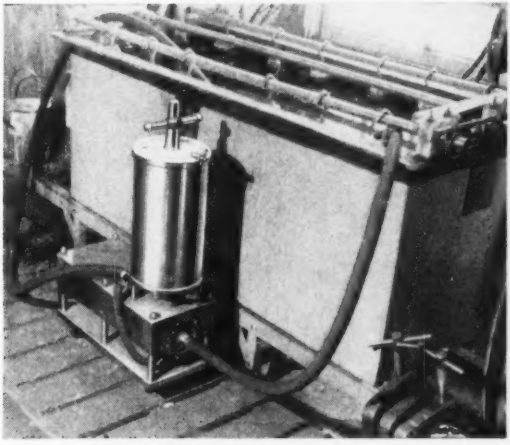

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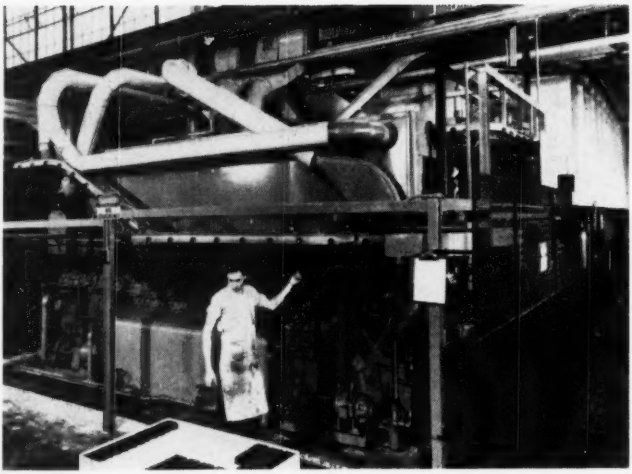

Fig. 12 — A compact finishing system comprising alkali wash and phosphatizing facilities, drying, painting and baking sections, presents complex ventilation and air handling problems to the equipment designer. The machine shown here is installed in the Ypsilanti plant of the Ford Motor Company and is designed to process generator regulator covers at a rate of 1440 units per hour.

(Photo courtesy Cincinnati Cleaning and Finishing Machinery Co., Ironton, Ohio.)

and air-flow dampers in the ducts. The completed job in all but the simplest units represents a complicated balancing of many variables, and the efficiency is highly susceptible to amateurish attempts to modify the operation, and especially to overload the blower by adding new duties.

Transport Velocities

When particulate material such as dust is to be handled in an exhaust system, there is a two-fold problem: first, of capturing the dust, and second, of transporting it through the duct lines to a suitable dust collector. A certain minimum velocity must be maintained in the pipes in order to keep the material in motion. This velocity depends on many factors such as particle size, shape, and density, as

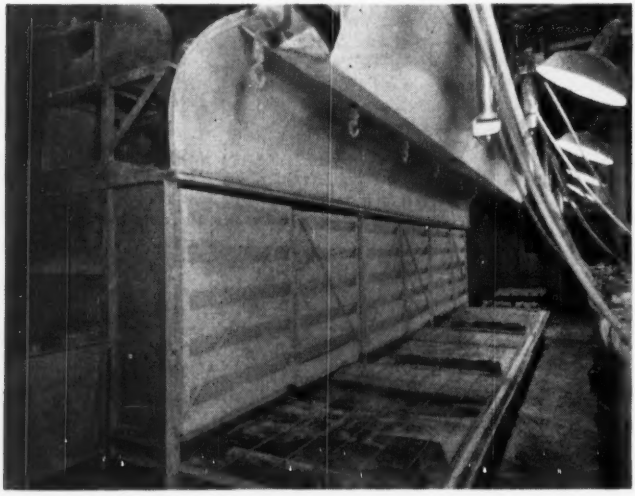

Fig. 11—By reason of the differences in particle size, solvents employed, and nature of the material sprayed, porcelain enamel spray booths present ventilation problems differing greatly from those found in paint finishing plants. This illustration shows the interior of a water wash wet deck porcelain enamel spray booth. The dry panels in front of porcelain enamel separators are used to separate the major portion of the sprayed frit before it enters the water wash section.

(Photo courtesy George Koch Sons, Inc., Evansville 4, Indiana.)

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well as any tendency of the particles to coagulate or stick to the walls. Transport velocities from 1600 to 4000 f.p.m. are recommended for most industrial dusts.

Some recent exhaust systems have been designed to operate at velocities lower than that required for transporting the dust. In these units, solids settle out in the duct work itself, and are removed continuously or occasionally by manual or mechanical means. Such low-velocity systems use considerably less power than conventional systems, and also permit the realization of savings through the use of fans instead of blowers. The larger size of duct required however, adds to the cost; so each system requires an economic and engineering study in order to arrive at the proper choice.

The statements in this brief article by no means cover all of the points which must be considered in planning a ventilation system for a plating tank, spray booth, or other finishing unit operation, and such design work is better left to a man with experience in ventilation work. It is hoped, though, that these comments may indicate to the reader some of the reasoning back of the engineer's design, and may show how casual and unauthorized "improvements" can greatly reduce or destroy the operating efficiency of a ventilation system.

* * *

Copper Fluoborate Electrotyping

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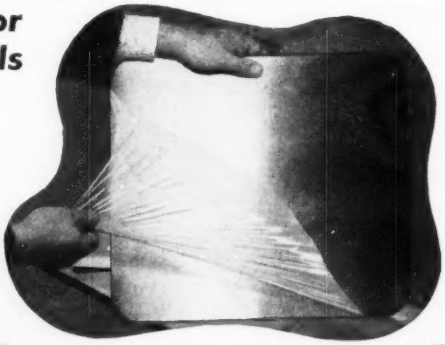

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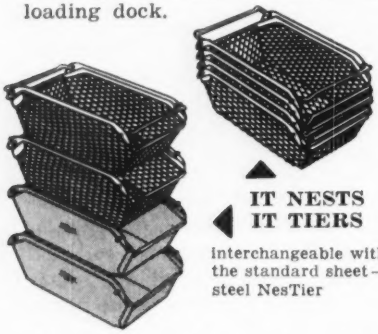
Plant engineers have discovered that the NesTier Expanded Metal Basket, extremely light and remarkably strong, is perfectly adapted to all round use as a tote box — the perfect container for small parts from stockroom to loading dock.



IT NESTS
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interchangeable with the standard sheet—steel NesTier

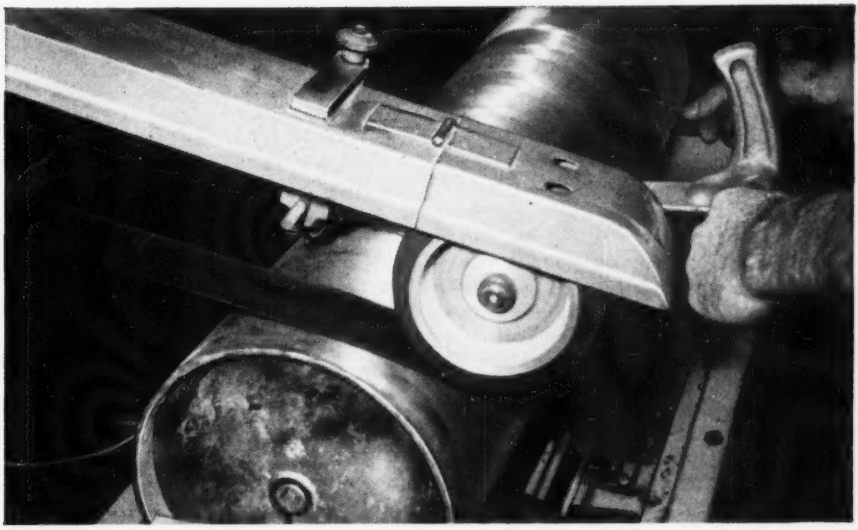
Now small parts may be routed through every plant operation without changing containers. NesTier baskets serve as flexible stockroom fixtures, may be transported tiered or nested on pallets, are adaptable to roller or overhead conveyors or may be carried easily by hand. Require a minimum of storage space.

Write today for bulletin describing the NesTier System.

NESTIER
IT NESTS—IT TIERS
The Chas. Wm. Doepke Manufacturing Co., Inc.
Rossmoyne, Ohio — Metal Specialties Division

pal variation of an electrotype from the average piece of plated ware is that each item is an individual piece of work, not duplicated by any other item in the lot. If one electrotype page is damaged during processing or is rejected at any stage of its manufacture, there is no other piece which can be substituted for it, but the entire job must be re-worked from the beginning. Proper scheduling of production thus becomes a major problem in the electrotyping industry, especially when it is made more complicated by the occasional necessity of reworking damaged pages. Speedy processing is therefore essential in the electrotyping business, in order that a complete job may be delivered to the customer in proper sequence, without omissions due to accidents in processing. Another reason for haste lies in the fact that much electrotyping work is the replacement of plates damaged or worn on the printing press. Since the press may be out of operation during the time required to duplicate a damaged page, it is obvious that rapid production facilities are needed.

At the recent Spring Conference of the International Association of Electrotypers and Stereotypers, held in Pittsburgh, James E. Thomas of The Capital Electrotype Company, Albany, reported on recent progress made by this company toward speedier production of electrotypes. As reported by Mr. Thomas, the total production time of an electrotype "shell" has been of the order of $5\frac{1}{2}$ hours, of which $3\frac{1}{2}$ hours was consumed in the plating cycle. This company has reduced the nickel plating time from 90 to 20 minutes by use of the sulfamate plating bath (to be described in a later article in PRODUCTS FINISHING). By converting the copper solution from sulfate to fluoborate, the copper plating time has been decreased from 120 to 40 minutes. This reduction of more than 70 per cent in plating time is an



Water softener tanks finished 200% FASTER with 3M Abrasive Belts!

Production Problem: To cut unit costs of rough finishing zinc-coated water softener tanks. Zero Water Softener Mfg. Co. was using 5″ diameter disc grinder on a flexible shaft which finished only 6 tanks an hour, left unsatisfactory finishes, tired operators.

3M Solution: A 3M Representative suggested that this Chicago manufacturer switch to a swing grinder using fast-cutting 3M Belts (#36 Three-M-ite Cloth, size 2½″ x 72″) run over a 6″ wheel. Grinding was done *behind* the wheel on the unsupported belt.

Results: An immediate production increase from 6 to 20 tanks an hour with a higher quality finish. Each belt finishes 55 to 60 tanks with far less operator fatigue!

3M Abrasive Belts can cut *your* costs, too! A 3M Representative will be glad to analyze your abrasive problems. Of course, there's no cost or obligation.

—WANT MORE INFORMATION?—

Minnesota Mining & Mfg. Co.
Dept. PF-63, St. Paul 6, Minn.

☐ Send me free booklet: "Case History Reports on 3M Abrasive Belts."
☐ Have 3M Representative call.

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Company.....
Address.....
City.....Zone...State.....

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Makers of: "SCOTCH"® Pressure-Sensitive Tapes • "SCOTCH"® Sound Recording Tape
"3M" ® Adhesives • "UNDERSEAL" ® Rubberized Coating
"SCOTCHLITE" ® Reflective Sheeting • "SAFETY-WALK" ® Non-Slip Surfacing

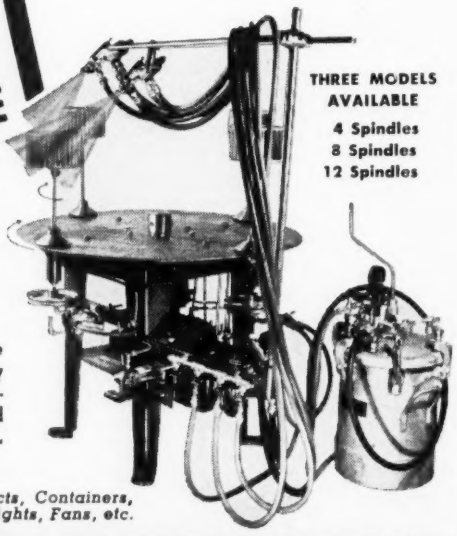
indication of real progress in the electrotyping industry, in that it provides prompter and better service to the customers, both on rush jobs and on the replacement of work spoiled during processing.

The principal new problem which arose in connection with the copper fluoborate bath was the cooling of the solution. The higher current densities used in the new process produce more heat, which has to be dissipated; and, since good temperature control is desirable, the removal of this heat has not been easy. The corrosive nature of the fluoborate solution does not permit the use of the conventional lead cooling coils; however, Karbate heat exchangers have been satisfactory in the pilot plant, and will be used in the larger commercial units now being installed.

Excessive heating of electrical conductors has also been a problem. The new 400-gallon tank will require 7500 amperes at 12 volts, and each of its nine crossbars may carry as much as 1000 amperes. These crossbars are being changed from one inch to 1½ inch diameter to avoid overheating. This requires also a change in the hooks by which the electrotypes are suspended from the crossbars. The hook contacts must be tight in order to prevent arcing at the high currents carried; and these supports must be rigid to prevent swaying of the work in the bath, since contact between the work and the anode would cause severe burning and damage to the electrotype.

Operating conditions for the copper fluoborate bath used by The Capital Electrotype Company, supplied by the General Chemical Div., Allied Chemical & Dye Corp., were specified for

HOLLAND
automatic-pneumatic
SPRAYING MACHINE



THREE MODELS AVAILABLE
4 Spindles
8 Spindles
12 Spindles

• GIVES AN EVEN FINISH
• SPEEDS UP PRODUCTION
• IMPROVES QUALITY OF PRODUCT

This new fully automatic, portable spraying machine is activated *solely* by air pressure. Only one operator is needed to load, and remove finished and unfinished work. WRITE FOR FULL INFORMATION.

Ideal for spraying: Cans, Novelties, Compacts, Containers, Aluminumware, Electrical Appliances, Flashlights, Fans, etc.

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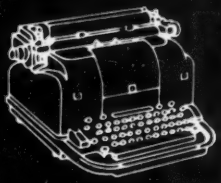
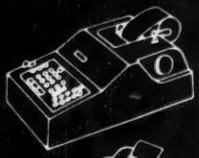
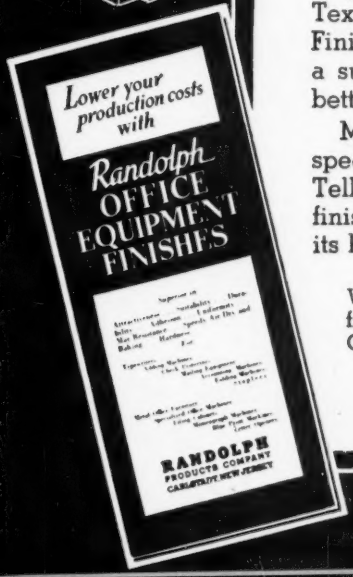
Randolph MAKER OF FINE







OFFICE EQUIPMENT FINISHES

Make no mistake about it—the finish you choose for your office equipment is as important to it as smooth, attractive, unblemished skin to a human being. Whether you manufacture, refinish or recondition office equipment, consider Randolph's highly specialized research and resources as a mighty ally in supplying the finish your product needs.

What is your product? Typewriters? Adding machines? Metal office furniture, filing cabinets, staplers, letter openers? From an amazing variety of finishes—Randolac, Metallic Randolac, Randolph Colored Lacquers, Baking S.G. Enamels, Texture Enamels—Wrinkle, Hammered Metal Finishes and Baking Primers—you can achieve a surface coating that will serve your product better at less cost!

More than 60% of Randolph's output is specifically formulated for individual customers. Tell us what you want—and be sure to get a finish that will show and keep your product at its best!

Write for our brochure "P" on office equipment finishes. We will be glad to send it to you—free. Consult us if you have any finishing problems.

RANDOLPH
PRODUCTS COMPANY
CARLSTADT, NEW JERSEY

ATTENTION:

Plant Safety Engineers

Here's How YOU can Prevent Production Losses Caused by Dermatitis . . .

Reduce Medical Costs and Improve Industrial Relations

Dermatitis actually wastes *more* man hours and medical treatment dollars than the more sensational industrial "accidents".* Furthermore, dermatitis cases cause revulsion, not only among afflicted employees, but their co-workers as well.

You can prevent these distasteful situations by providing the *proper* protective garments and *insisting* that personnel in your plant always wear them when in contact with irritating substances.

Gloves are especially important in reducing dermatitis cases and your production managers will thank you for choosing the *right* gloves for each job. Comfortable fit, hand freedom and long wear pay off in employee good will, increased production and lowered operating costs.

PIONEER liquid-tight Stanzoil® gloves, made of oil and acid resistant non-allergic DuPont milled neoprene, are reducing hand dermatitis hazards in hundreds of plants all over the world. 32 safety styles, weights, size and colors . . . PIONEER catalog shows you *at a glance* how to choose the most efficient and economical glove for the job.

Don't risk costly time out — write for complete information today.

**Occupational Hazards, December, 1952*

Industrial Products Division

The PIONEER Rubber Company

285 Tiffin Road • Willard, Ohio

Quality Gloves for 35 Years

P.S. If your glove problems are unusual because of the nature of your product finishing operations, PIONEER welcomes the opportunity to help you solve them. Write us about your needs and problems — you'll save money, improve your glove service.

electrotyping operations as follows:

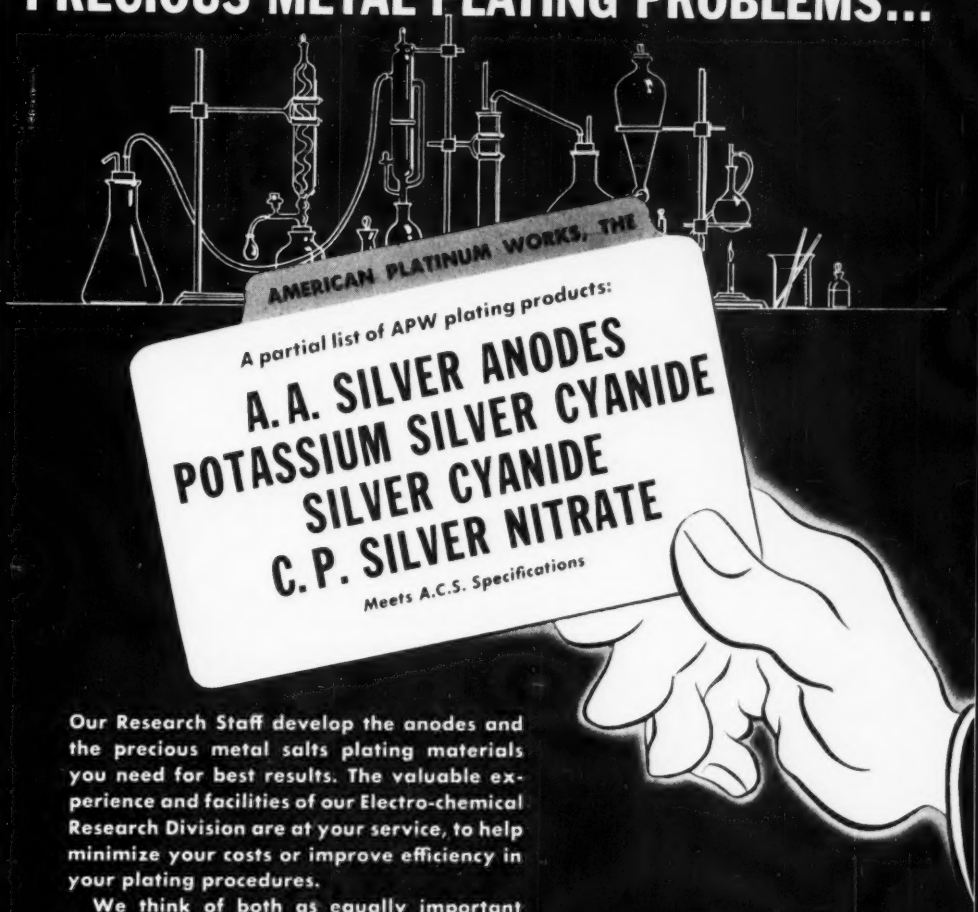
Copper metal	120 g/l
Free fluoboric acid	40 g/l
Density	37 to 38 deg. Baume
pH (colorimetric)	0.2 or less
Temperature	95 deg. F.
Agitation	Strong air agitation
Current density	200 to 600 amp./sq. ft.
Voltage	App. 10 volts
Cathode: anode ratio	1

The plating speed with the fluoborate solution is comparable with that obtained in the traditional sulfate bath at an equal current density, but the current density which can be tolerated by the fluoborate bath is much higher.

In order to evaluate the copper fluoborate electrotyping solution fully, further tests on the effects of temperature, addition agents, and other variables are planned; but the installation of commercial equipment is going ahead without these additional data, since the process is already producing fully satisfactory electrotypes. The Capital Electrotype Company will include a copper fluoborate plating bath in the regular production line, following the sulfamate nickel. This new copper tank will be of 400-gallon capacity, and will operate at a maximum power of 7500 amperes, 12 volts. This unit will permit increasing production from 8 pages per 40 minutes to 36 pages in the same time. A five-pass Karbate heat exchanger will be used to obtain the necessary cooling when operating under this 90-kilowatt load; based on the use of 65 deg. F. cooling water, and maintenance of a 95 deg. F. bath temperature. Automatic temperature controls will be provided to hold this condition as nearly constant as possible.

With the pilot plant installation, there have been occasions when a plate has been delivered to the press room within 90 minutes after the recast had been ordered. This is a signi-

TO HELP SOLVE YOUR PRECIOUS METAL PLATING PROBLEMS...



Our Research Staff develop the anodes and the precious metal salts plating materials you need for best results. The valuable experience and facilities of our Electro-chemical Research Division are at your service, to help minimize your costs or improve efficiency in your plating procedures.

We think of both as equally important services and APW welcomes requests for either one or for both. No charge for the technical service—we just want to be sure you use it—*freely*.

WRITE FOR INFORMATION AND CURRENT QUOTATIONS.

THE AMERICAN PLATINUM WORKS

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MOST WIDELY USED AND RECOMMENDED . . .

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SPEKALUMINITE

Reg. U.S. Pat. Off. Pat. Pending

Superior! Decorative!

ALUMINUM COATING

SPEKALUMINITE is tough • Will Not Peel or Flake • Rust and Tarnish Resistant (200 hrs. salt spray test) • Self priming • Adheres perfectly to all metals and plastics • Produces a beautiful Cadmium-Bright finish • COST LESS • LOOKS BETTER • LASTS LONGER • Easy to apply • Dip or spray and bake • Requires no expensive equipment.

Write for Free Sample and Bulletin No. PF-6.

Distributors Inquiries Invited

SPEKALUMINITE CO.

100 South Water St., Ossining, N. Y.

ficant saving for the customer when he has an idle printing press waiting for the plate. In some cases it may even prove better to make a new plate rather than to attempt to repair one which has been damaged by press operations. It is expected that this rapid production time will be maintained in the commercial plant, at least when it is required by an emergency.

VINSYNITE FOLDER. A six-page folder produced by **Specialty Coatings, Inc., Division of Thompson & Company,** Oakmont, Pennsylvania, describes Vinsynite pretreatment for all types of metals. It includes details of the manner in which Vinsynite is used in finishing six different types of metal products for good paint adhesion ond corrosion resistance. Also included are test data to show that Vinsynite is unaffected by severe distortion and exposure to standard A.S.T.M. salt spray test.

For Dust Free Finishes!

BOND TACK CLOTH

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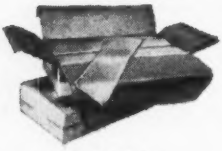
Cut off any size piece to use as needed.



IN BULK

Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available in Rolls or Cut Bulk—White or Gold

In Three Different Types of Cloth

Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up!

The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free* and *Wax-Free*. Gives a sparkling speck-free Finish *every time*. Clean and sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

BOND CHEMICAL PRODUCTS CO.

"The Tacky Wiper Specialists"

2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

A WARRANTY OF SATISFACTION IN EVERY CARTON

MURRAY WAY

THE BETTER WAY IN AUTOMATIC POLISHING, BUFFING and GRINDING

MICRO-POLISH—pre-finishes steel sheet, strip or blanks before forming. Gives you better plating or organic finish, easier deep draw, less die wear.

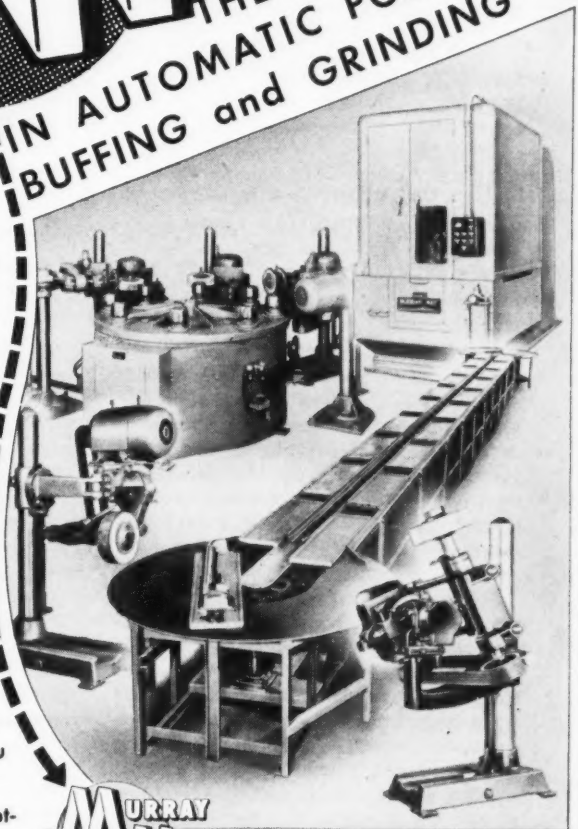
CONVEYORS—built precisely to your needs—using outstanding Murray-Way engineering ideas.

DIAL TABLES—incorporating Murray-Way rotary-indexing features for unequaled performance.

POLISHING HEADS—that top the field for versatility and efficiency.

For combined top technical knowledge and finest equipment, for your metal surfacing operations, you can't beat Murray-Way.

Your inquiries will be promptly answered.



MURRAY WAY **THE MURRAY-WAY CORP.**
POST OFFICE BOX 180—BIRMINGHAM, MICH.
AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

Finishing Clinic

In this department are presented some of the questions submitted by readers together with suggested solutions of the problems outlined.

Question. *We are considering the production of a line of ornamental metal furniture and wish to accumulate all the necessary manufacturing data. Could you supply us with any information regarding the procedure by which black oxide finishes are applied to plain carbon steel after forming and assembly?*

A. K.

Answer. The process of applying black oxide finishes is relatively simple, consisting of boiling the metal to be treated in a strong solution of caustic soda to which certain activators have been added. The process has been developed considerably by a number of companies marketing blackening solutions and we should like to refer you to these companies for more specific information. (Names of a number of companies furnished.)

Question. *We are fabricators of aluminum storefronts, doors, railings, and so forth. Materials used are extrusions and heavy gauge sheets. All products are Alumilited.*

Our problem is to obtain a polished Alumilite finish rather than the grained or satin finish we now obtain through abrasive belting. We assume material would have to be buffed to a mirror finish before Alumiliting. This might be practical though expensive for small sections but would produce laps and wheel marks in wider surfaces.

Is there any electro or chemical process that might produce such a finish?

H. I.

Answer. There is an electrochemical polishing process for aluminum and for details of that process we are referring you to the company licensing

that process.

There is also a chemical process for producing a bright finish on aluminum and for information regarding that process we should like to refer you to the company concerned.

Further information might be obtained more quickly from the L. H. Butcher Co., 3628 E. Olympic Ave., Los Angeles 23, California, a representative of many plating equipment and process suppliers in your area.

———— *fc* ————

Question. *As manufacturers of steel office and laboratory furniture, we are especially interested in securing as good a finish on our furniture as possible. We should be highly obliged if you could inform us what types of primers, paints, or enamels are used in metal furniture finishing, temperatures at which the various coatings should be baked, and the names and addresses of suppliers of materials used.*

T.M. Co.

Answer. The finishing of metal products with organic finishes usually follows a procedure of smoothing the base metal, cleaning and phosphatizing, followed by the application of one or more paint coatings.

For smoothing welds and other irregularities in the metal, either hand tool grinders with abrasive discs or conventional polishing lathes are employed. Information regarding these products may be obtained from the following companies: (names of seven companies furnished).

Degreasing solvents, cleaners and chemicals employed in phosphatizing processes are marketed by the following companies: (names of ten companies furnished).

Primer paints and vinyl type enamels or any other combinations desired can be specifically formulated to the requirements of a finishing process. For further information, we refer you to the following paint manufacturers: (names of eight companies furnished).

———— *fc* ————

Question. *What can be done to prevent tarnishing of silver? We have tried lacquers and waxes but when parts are stored for four or five months tarnishing is present. Is it possible to get information as to the facts or theories of tarnishing of silver?*

J. W. C.

Answer. You have touched on a problem which is common to all silver platers or processors. It is admittedly quite difficult to treat silver to prevent tarnish.

Silver tarnishes because of the presence of sulfides or similar corrosive gases in the air, and the formation of tarnish is aided and abetted by moisture. Hence, if silver can be stored in a moisture free atmosphere or in an atmosphere free from sulfur or other similar gases the finish will remain bright for a considerable period of time, even without protection.

As you can well realize, the lacquer manufacturers have given considerable thought to this problem and have developed clear lacquers for the purpose. You might like to contact the following companies for further information on special lacquers for silver. (Names of a number of companies listed.)

If, in silver plating articles, it is not necessary to have a 100 per cent silver plate, a deposit containing a small percentage of zinc is much more effective in resisting tarnish and staining than the pure silver.

We are referring to you a number of companies marketing silver plating processes from whom you can obtain more detailed information.

SUGGESTION IMPROVES FINISHING PROCESS

Perforated Paint Mask

SUGGESTION of The Year by factory employees of The Firestone Tire & Rubber Company resulted from the teamwork of these two employees of the Company's defense products plant in Akron, Ohio. Richard L. Prillaman (left) and Harold Archer discuss the perforated plate they devised to be used in the ends of five-inch rocket tubes to reduce the amount of paint lost through the open ends of the tubes during the painting operation.

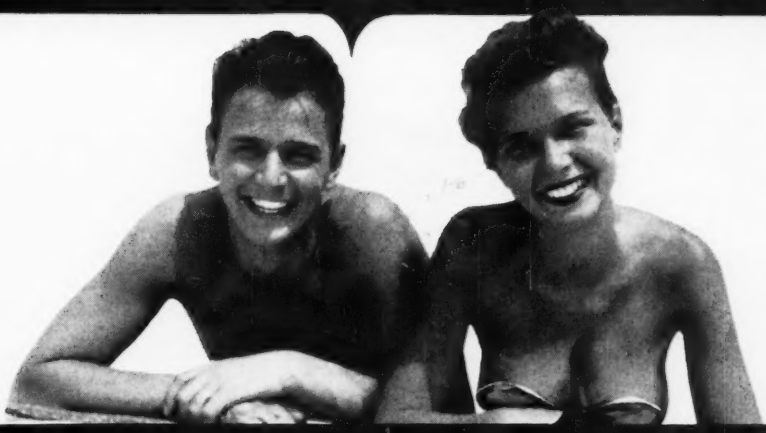
The plate is shown in the rocket tube at left while an open rocket tube is shown at right. The plate, serving as a mask, is designed with just enough vent holes to permit the proper amount of pressure to be used in the paint spray gun. Adequate paint coverage of the inside of each tube is assured, and excessive loss of paint is prevented.

This suggestion was submitted for publication in PRODUCTS FINISHING by Firestone News Service, Akron, Ohio.

Send employee suggestions which have resulted in improved finishing processes (electroplating, lacquering, enameling, porcelain enameling, galvanizing, and so on) to PRODUCTS FINISHING.

PRODUCTS FINISHING 431 Main Street • Cincinnati 2, Ohio

YOU'RE IN GOOD COMPANY



WITH *SPEEDIE* BUFFING COMPOUNDS

CHOOSE any field you wish — automotive . . . hardware . . . electric appliances — you'll find some of the best known names — the most successful manufacturers — using *SPEEDIE* Buffing and Polishing Compositions.

There are several good reasons for this preference for *SPEEDIE* by those who want to make a profit in these hard to make-a-profit times.

SPEEDIE Compositions in both bar and liquid form are designed to save you on-the-job money. They last longer, give better buff wear.

CLEANING IS NO PROBLEM WITH:

SPEEDIE Tripoli — Stainless Steel — Chrome — Nickle Finish — Grease Stick or Emery Cake Compositions. There's a *SPEEDIE* Compound for heavy cut, light buffing or coloring to a mirror finish.

Write us *on your company letterhead* about objects to be buffed, type of buff used, problem you may be having and how many bars of *SPEEDIE* Compound you will require for an experimental run. Your request will be given immediate attention. Write today.

Photo by Underwood & Underwood

BP

THE BUCKEYE PRODUCTS CO.

7038 Vine Street Cincinnati 16, Ohio

Cable address: Buckprod

Finishes

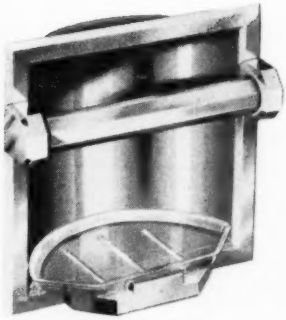
The body of the Nolin Beverage Cooler is formed from aluminum sheet and finished by Alodizing, spraying of a one-coat hammer finish, and baking at 300 deg. F. with infra-red heat.

(Photo courtesy Nolin Mfg. Co., Montgomery 2, Alabama.)

Royal Chef Portable Barbecue Grill, Model No. RC-37, exhibits the following finishes: body—Royaltex (tan) baked-on synthetic enamel; legs—highly polished tubing; spit—bright nickel plate; grid—bright zinc plate; firebox and spit supports—high temperature baked-on aluminum paint.

(Photo courtesy Chattanooga Implement & Mfg. Co., Chattanooga 6, Tenn.)

that aid in appearance and utility

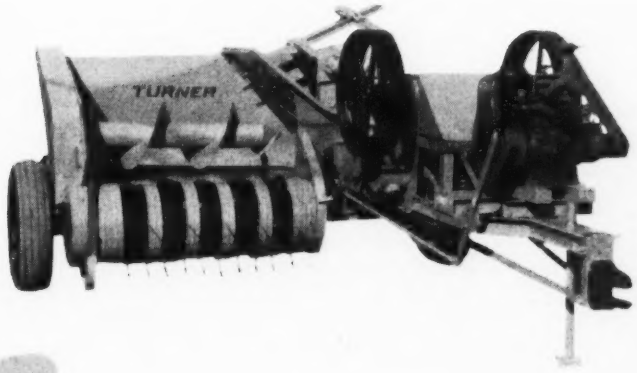


New glamor for the bathroom is reflected in this soap holder and grab bar, finished in Lifetime Chrome by Gerity.

(Photo courtesy Gerity-Michigan Corp., Toledo 4, Ohio.)

Finishes on farm machinery, such as the Turner Stationary Hay Baler here illustrated, usually comprise a two-coat system. The primer coat is formed by dipping, and after drying, the finish coat is applied by dipping or spraying.

(Photo courtesy Turner Mfg. Co., Statesville, North Carolina.)



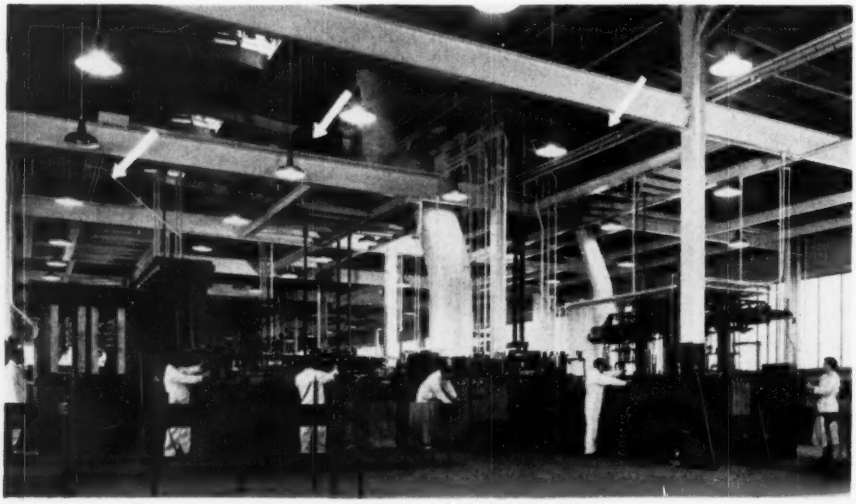
NEWS of the Industry

NEW PLANTS

Designed to meet almost any conceivable specification of any company product is the new, $640,000 electroplating plant **WESTINGHOUSE AIR BRAKE CO.** placed in operation recently at the Swissvale plant of its **UNION SWITCH & SIGNAL DIVISION,** Pittsburgh, Pennsylvania.

Introducing mass production techniques to job-lot electroplating, the new plant features equipment for fully and semi-automatic, barrel and still plating of a variety of metals. It was originally designed to consolidate Westinghouse Air Brake's plating facilities for all divisions and subsidiaries, but now, will also be available for commercial plating purposes. In this capacity, the new plant will offer quantity production on varied lines of small articles, lower costs due to increased production, controlled uni-

Fig. 1—Supplying power to the fully and semi-automatic and barrel-plating equipment in the newly-opened electroplating installation at the Union Switch & Signal, division of Westinghouse Air Brake Co., are the overhead rectifiers identified by the arrows. Also shown are some of the fans and pipes which help make the ventilation system outstanding from the viewpoint of safety.



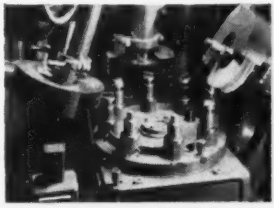
OSBORN

try this team for lower costs

Push-button brushing methods do jobs *better* and many times faster than by hand. For example:

Machine-powered Osborn Brushes are deburring parts 4 to 10 times as fast as hand methods. They are giving similar mass production benefits in cleaning and finishing operations of all kinds. Results are of uniform high quality. Rejects are practically nil.

Whether your product is metal, rubber, plastic or other material, ask to have an **O**sborn **B**rushing **A**nalyst study your operations to suggest improvements with the latest Osborn power brushing techniques. Call or write *The Osborn Manufacturing Company, Dept. O-6, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



HERE, three different types of Osborn brushes team up to boost deburring output of small parts 500%, and to produce smoother, more uniform results.

Osborn Brushes

OSBORN POWER, MAINTENANCE AND PAINT BRUSHES AND FOUNDRY MOLDING MACHINES

formity of plating, plating to any desired depth and fast, efficient service.

Handled by the new plant to tolerances sometimes as close as 0.00005 inch is much of the maritime and petroleum industry equipment produced by the firm's Industrial Products division, the railroad and aviation traffic-control equipment manufactured by the Union Switch & Signal, and the air-brake devices produced by the Air Brake division. Metals plated include nickel, copper, zinc, cadmium, chromium, tin, gold, silver, tin-over-cadmium, tin-over-copper and nickel-over-copper-flash.

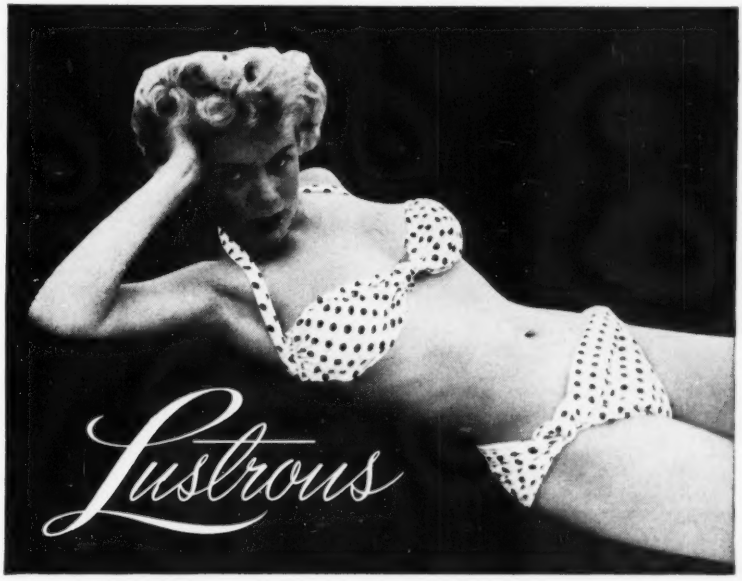
Because of the firm's own rigid specifications and military work in which it is involved, all plated items are frequently subject to highly corrosive, salt spray tests on as many as 30 qualification counts. Many have to pass tests over 200 hours in duration.

The equipment throughout the plant was installed on an assembly-line basis, and various modern conveyor systems facilitate transfer of items from operation to operation. Each piece of equipment is of the latest type, allowing employment of up-to-date plating methods and a complete program of treating operations. Production can be geared to plating millions of such items as nuts and bolts or to a handful of equipment cases.

Placed strategically in one section of the installation are two fully-automatic and three semi-automatic plating conveyors. Close by, are the still plating tanks that provide the individual attention some items require, and the cleaning, storage, plating lines and dryer of the barrel plating equipment.

Of the two fully-automatic conveyors, the cadmium-plating conveyor is the larger and the machine that makes mass production possible on a miscellaneous assortment of operations. Manufactured by the Hanson-Van Winkle-Munning Co. according to Union Switch & Signal specifications, it now performs the cleaning treatments for the semi-automatic conveyors, in addition to performing a full cycle of 17 cleaning, plating and finishing

Fig. 2—Shown here is the equipment already installed in one of the nation's most unique electroplating installations at the Swissvale plant of the Union Switch & Signal, division of Westinghouse Air Brake Co. In the foreground are the cleaning, storage and plating lines and dryer of the barrel-plating area. The large machine in the center background is the fully-automatic, cadmium-plating conveyor which makes job-lot plating possible on a mass production scale. The machine is flanked by semi-automatic, copper and tin-plating conveyors.



For many a product, the shining beauty of its finish provides the key to outstanding sales success. And surely the *extra* quality built into every truly fine product deserves the compliment of an equally fine finish — one which is especially developed to the requirements of the job it is to perform. In our laboratory, a competent staff of experienced technicians are constantly producing just such coatings for an endless variety of manufactured items. Won't you let us help with *your* problem?

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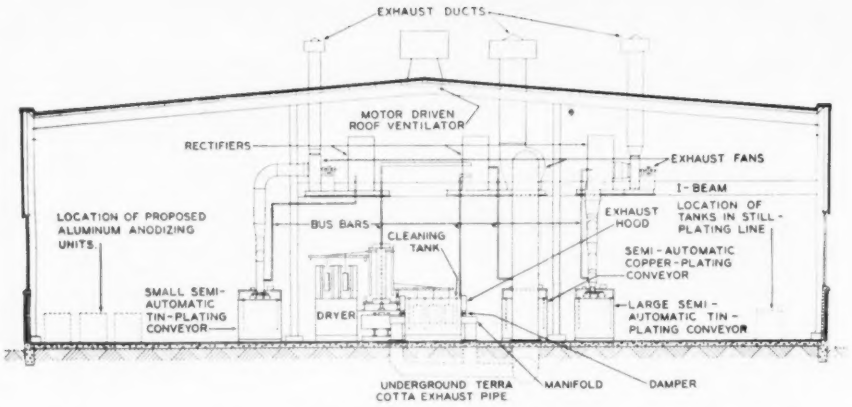


Fig. 3—A cross-sectional diagram of Westinghouse Air Brake's new electroplating plant, showing overhead rectifier locations, exhaust fans and ducts, and underground ducts of a down-draft exhaust system linked to tanks in the fully-and semi-automatic plating areas. Floor trenches are provided to drain away overflow.

treatments for the plating of cadmium.

The other fully-automatic conveyor was manufactured by the Udylite Corp., Detroit, and is being used to plate nickel over copper-flash on relay contact springs that play important roles in such Union

Solventol

RESEARCH ORIGINATED *

DI-PHASE

METAL CLEANING

Solventol Di-phase metal cleaning processes and compositions are so fundamentally different they have been patented.

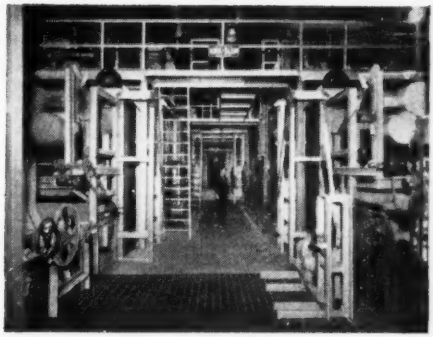
Information on these basically new metal cleaning advancements is available upon request. *Write to:*

SOLVENTOL CHEMICAL PRODUCTS, INC. • DETROIT 3, MICHIGAN

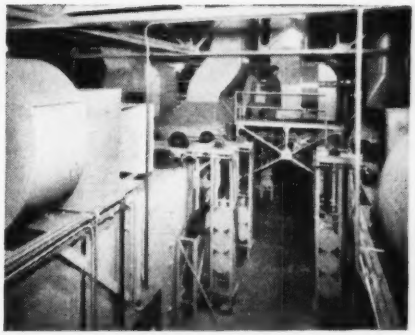
* Di-phase metal cleaning concentrates, baths and processes are covered by U. S. Patents Nos. 2,399,205; 2,399,267 and 2,583,165. Unrestricted licenses under these patents will be granted on request at established royalties.

DESIGNERS & BUILDERS OF SPECIALIZED

METAL CLEANING EQUIPMENT



Rock Wool Batt Production; fibres are formed into batts, compressed to proper density and baked.



Air Heating and Handling Equipment; ovens are gas-heated, atmospheric air used for cooling.

KIRK AND BLUM

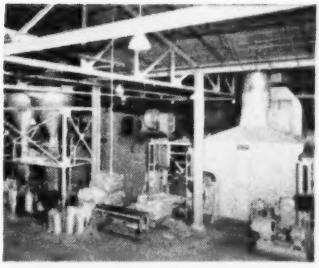
TWIN OVENS AND COOLING TUNNELS SPEED ROCK WOOL PRODUCTION

... at Philip Carey Mfg. Co., Cincinnati, Ohio

Recently installed at this noted insulation and building products manufacturer, twin KIRK & BLUM Ovens have increased rock wool production and assured continuous operation.

These specially designed three-temperature zone ovens bake the batts, setting the binder solution, and are individually adjustable for batts of varying thickness and density. Closed circuit cooling tunnels, handling 50,000 CFM of air each, completely cool the batts before packaging.

Whatever your needs in ovens...for drying, baking or dehydrating . . . consult KIRK & BLUM. There's no obligation. Write for booklet, "Industrial Ovens," showing other typical installations.



Dual Rock Wool Processing Lines; Ovens in left background and cooling tunnels at right. In left foreground is rock wool granule reclamation; particles are collected and bagged.

FOR CLEAN AIR ... THE INVISIBLE TOOL

KIRK AND BLUM

INDUSTRIAL OVENS

The KIRK & BLUM Mfg. Co. 3116 Forrer St., Cincinnati 9, Ohio

Switch & Signal railroad systems as centralized traffic control, coded track circuit control and automatic train control.

Udylite also supplied the barrel-plating equipment which includes facilities for plating copper, zinc, cadmium, nickel and tin on items handled in quantity.

The still plating equipment, though not as spectacular from an appearance standpoint as the three types already mentioned, will serve many definite purposes.

The building housing the installation is of steel frame, 90 feet wide, 200 feet long and 24 feet high with a 16-foot clearance. The outer walls consist of acid-resistant tile and brick to a height of six feet, followed in turn by continuous, blue-tinted corrugated glass and sheets of corrugated asbestos.

Comprising the roof is a layer of "Kaylo," a hydrous, calcium-silicate, insulating roofing tile overlaid with asphalt-cemented roofing felt. Each material used in the construction of the building was chosen because of its anti-corrosive qualities.

Working and cleaning areas are covered with a floor of acid-proof brick impervious to almost any chemical action. The cement holding them in place is of a varied composition, since the nitric, sulfuric and hydrochloric acids and numerous alkalis used in the cleaning treatments each has its own peculiar corrosive qualities.

Alongside the tanks are floor trenches to drain away overflow.

The ventilation and heating system was designed to circulate, heat and replace a maximum of 300,000 cubic feet of air per minute. Heating fans prevent drafts and help maintain an even temperature throughout, with general ventilating fans removing half the air, and individual exhausts on the plating tanks the other half. In addition, air louvres, complete with finned coil heating units are located in two of the outer walls to heat the replaced air.

To both heat the building properly and to protect the coils from freezing during cold weather, dual-controlled thermostats have been installed. The latter help maintain desired temperatures and also restore steam flow to the coils when the outside temperature drops below a certain level, regardless of inside temperature.

Since normal wind dispersal is sufficient to counteract any fumes in the ex-

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• Buff performance is proved in the polishing room, and by the operator who does the work—and sometimes has a difficult buffing job to handle. In such spots, our BIAS Buffs stand out in satisfying service, and where material and construction show up to back up our claims.

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The BIAS BUFF and WHEEL CO

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Thirty-five feet long, this Hercules trailer contains all the latest information on lacquer for formulators and users. In addition to exhibits, it is equipped with facilities for showing Hercules lacquer films, can be used as a conference room, and carries basic types of up-to-date spraying and lacquer heating equipment.

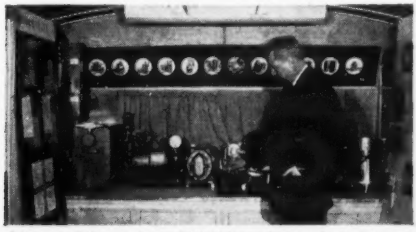
NEW TOURING EXHIBIT BRINGS LATEST IN LACQUER TO INDUSTRY'S DOOR

This 35-foot trailer—fitted out as a combined exhibit booth, application laboratory, conference room, and movie theater—is Hercules' way of bringing the latest in lacquer developments directly to industry for on-the-spot investigation and discussion.

The "Mobile Lacquer Information Center" will visit lacquer manufacturers throughout the United States. It may be scheduled for your locality. Contact your lacquer supplier for further information.

Cellulose Products Department
HERCULES POWDER COMPANY
927 Market Street, Wilmington 99, Delaware

Test panels in the "Mobile Lacquer Information Center" are displayed for easy examination.



A feature of the traveling exhibit is the various types of equipment used for heating and applying hot lacquer.

Interior, showing some of the test panels, samples of actual lacquer applications, available literature, and equipment. 6053-9

hausted air excepting nitric oxide, there is no danger of contaminating the atmosphere around the building. A water alkali solution is employed to wash down the air before exhausting and to neutralize the nitric oxide. Windows have been eliminated to enable the system to operate at peak efficiency, and doors are kept closed whenever possible.

Drawn into the plans were many provisions both for personnel safety and for conformance to Pennsylvania's pure streams act and the rulings of the Allegheny County Sanitary Authority. As a result, every tank is connected to an intricate down-draft exhaust system.

Fumes in these tanks are drawn down through the floor by individual vents and emptied into a network of large, underground terra cotta ducts. There, because the ducts are at a cold temperature, the moisture in the fumes is condensed and emptied into the sewer system. The air within the ducts flows counter to the condensed moisture and is led up through a system of fans to the outer atmosphere. Each underground duct is fitted with an individual trap to prevent any air from the sewer system from reentering the exhaust system.

THE JOHN B. MOORE CORP., P. O. Box 3, Nutley 10, N. J., specializing in the origination and marketing of solvent products designed to replace hazardous substances used in industrial cleaning and maintenance operations, has taken larger offices in the Lee Building, 349 Franklin Ave., Nutley. Mailing address for the firm will remain as P. O. Box 3.

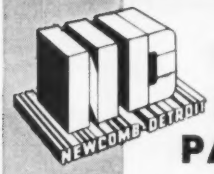
According to John B. Moore, president, substantial increases in the demand for its products and services is the reason for the move.

The establishment of a new sales-service laboratory to provide additional technical assistance to the protective coatings industry has been announced by **HERCULES POWDER COMPANY'S** Cellulose Products Department.

The new laboratory is located at the Experiment Station at Wilmington, Delaware. It now will be possible for Hercules to expand present facilities for providing direct technical service to customers on both the manufacture and use of protective coatings based on nitrocellu-

NEWCOMB-DETROIT

PIONEERS IN ENGINEERING, MANUFACTURE AND INSTALLATION OF



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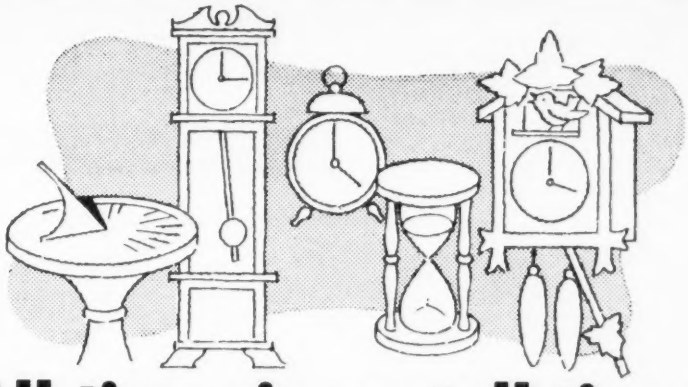

All timepieces tell time!

Time is an important element especially when it involves cleaning, stripping, coating or other pre-finish operations. Time is important as an element in quality and in cost.

Difficulty in attaining the result you seek may be a matter of timing only. Klem Engineers will not only specify the proper chemical for your job, but steer you in proper application, timing, temperatures, concentrations, etc. The extensive experience of this organization and lab facilities for exactly duplicating your conditions make possible more accurate analysis and recommendations.

KLEM PRODUCT of the MONTH

KLEM KOTE

Cleans and conditions iron, steel and aluminum surfaces, imparts a fine phosphate coating on metal surfaces for better paint adhesion. KLEM KOTE is non-toxic, non-inflammable, requires no special handling precautions Write for details.

3 OF 20 STANDARD KLEM PRODUCTS

MINIT KOTE—Cleans, neutralizes, phosphatizes ferrous metals and aluminum surfaces in 60 seconds for better paint adhesion.

BRITE KOTE No. 80—Protective dip before storage of copper and brass, removes all oxides and stains—an excellent protection from further corrosion

KLEM KLEANER No. 167-PG – Still or soak tank cleaner for non-ferrous metals. Economical, efficient – will safely remove normal types of soil.

KLEM Chemicals Inc.
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lose, ethyl cellulose, cellulose acetate, and chlorinated rubber.

The laboratory will be under the direction of **JAMES R. YEAGER**, manager market-development coatings, Cellulose Products Department. **RUFUS F. WINT** will act as coordinator and **GREGORY N. BRUXELLES** as supervisor of the laboratory.

S. G. Bart, president of **BART MANUFACTURING CORPORATION** of Belleville, New Jersey, has announced completion of a second new building on the six-and-a-half-acre industrial tract of the corporation in Newark, N. J. The new building, comprising approximately 12,000 square feet of production space, will be used exclusively for precision electroplating of heavy industrial equipment being produced for Atomic Energy Commission projects.

Completion of the new plant marks the second step in the expansion program of Bart Manufacturing Corporation and affiliated companies, Bart-Messing Corporation, Bart Laboratories Co., Inc., Bart Products, Inc., and Sel-Rex Precious Metals, Inc. The first plant on the new tract was opened last spring for Bart Products, Inc., which is also heavily engaged in production for A.E.C. projects.

COMPANIES

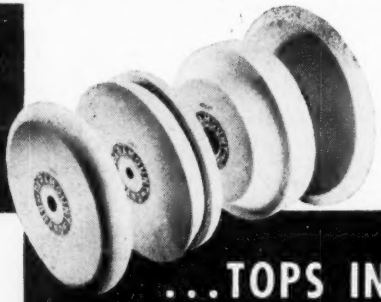
THE DETREX CORPORATION, Detroit, Mich., has announced development of a new process which results in the simultaneous production of trichlorethylene and hydrogen chloride, according to an announcement made by A. O. Thalacker, president of Detrex.

The new process will be installed in the Ashtabula, Ohio plant, and conversion is expected to be completed by April, 1954. There will be no interruption in the production of trichlorethylene at the time of the changeover to the new process, according to Mr. Thalacker.

Manufacturing operations at the Hooker-Detrex Ashtabula plant will continue to be under the supervision of the Hooker Electrochemical Company of Niagara Falls, N. Y.

PARAMOUNT BRAND

FELT WHEELS



...TOPS IN "Contourability"

Are you finishing articles which require a wheel with a "shaped" or contoured face? Don't forget that felt wheels lend themselves to contouring probably better than any other type of wheel. Don't forget, too, you have nine degrees of hardness to choose from when you buy Bacon Felt Wheels—The Paramount Brand. Ask your supply house for Paramount Brand Felt Polish Wheels.

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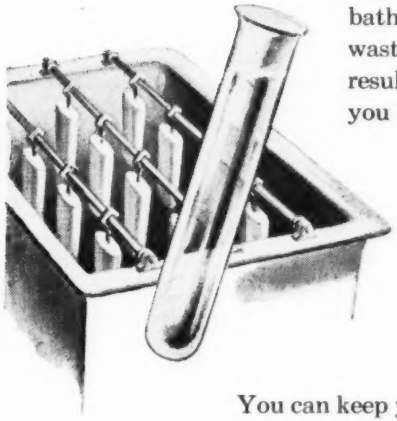
Your Supply House can Furnish Bacon PARAMOUNT BRAND FELT BOBS & WHEELS

FOR BETTER PLATING—
baby your bath!



It pays to take good care of your plating bath. You'll get better adhesion . . . less wastage of scarce metals . . . improved results even with thinner deposits . . . when you keep the solution free of impurities.

Start CLEAN
Stay CLEAN

You can keep your solutions in top condition —easily and economically—by using Red Label Darco S-51 regularly. This carbon has every quality that electroplaters demand. It contains no traces of sulphides that could cause dullness, poor adhesion, or brittleness. It has exceptional adsorptive capacity; a little Darco takes out a lot of impurities. And it's a cinch to handle in the shop—wets readily, and mixes quickly into slurries.

Order your stock from your local supplier now. Be sure to specify Red Label Darco S-51, the activated carbon especially made for purifying plating solutions.

DARCO DEPARTMENT
ATLAS POWDER COMPANY
Darco General Sales Offices
60 East 42nd Street, New York 17, N. Y.
Atlas Powder Company, Canada, LTD., Brantford, Canada

Perfection of the new process is reported to be the result of an intensive, six-year program carried out jointly by the research laboratories of Detrex and Hooker. Pilot plants producing both trichlorethylene and hydrogen chloride were set up in Detroit and Niagara Falls in 1947.

INTERCHEMICAL CORPORATION has announced the establishment of scholarships at six liberal arts and technical colleges. When in full operation, scholarship funds of $1,000 will be provided at the colleges for awards to science students in their junior and senior years. The program will begin during the 1953-54 academic year with funds of $500 for awards to juniors.

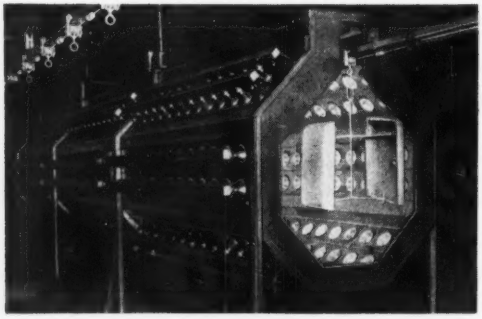
In each case the grants will be made by the scholarship committee of the colleges on the basis of demonstrated scholastic achievement, character and leadership potential. Students who are majoring in chemistry, chemical engineering, and related sciences will be eligible.

The method of selecting students for the scholarships, their courses of study and all other matters will be in the hands of the colleges involved. Interchemical has requested that the grants be made without competitive examinations.

Colleges where scholarships will be awarded are Case Institute of Technology, Clemson Agricultural College, Illinois Institute of Technology, Lowell Textile Institute, Polytechnic Institute of Brooklyn and Rutgers University. These institutions are located near Interchemical factories and laboratories and offer courses related to Interchemical s fields of activities.

A full-scale model of a typical wall section for school construction will be exhibited at the national American Institute of Architects' convention in Seattle, Washington, June 16-19, by **ALUMINUM COMPANY OF AMERICA**, 801 Gulf Building, Pittsburgh 19, Pa. The spandrel area will be porcelain enamel on aluminum extrusions.

There will be also a dozen other samples available to demonstrate the wide color choice possible. The supplier of the porcelain enamel finish materials claims resistance to sun fading, and that the material can be drilled or sawed without danger of progressive chip-back by corro-



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. . . down comes your unit production cost . . . up goes productivity and profit! Moreover, this equipment can pay for itself with the economies earned from speeding up your coating, baking, and drying operations. Rain or shine, hot or cold, your production is controlled . . . the quality consistently maintained. And these units are quickly adaptable to either defense or normal use.

Send for catalog and engineering data.

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Designers, Engineers, Manufacturers of Production Equipment

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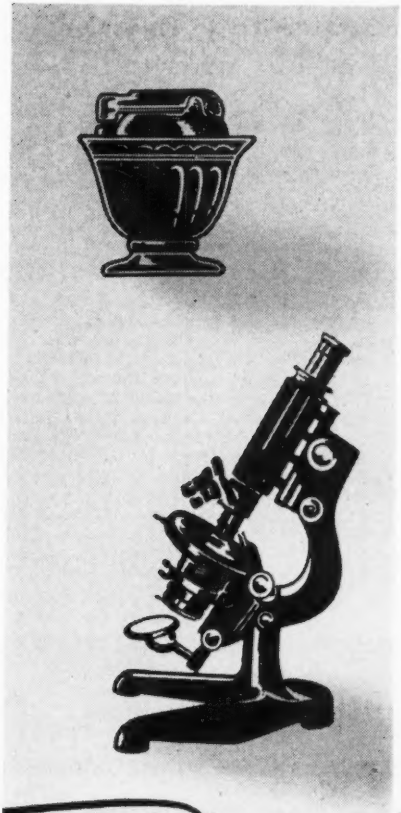

Rhodium is a very hard, brilliantly white metal which never tarnishes. One of the platinum group, it resists corrosive agents that attack other metals instantly and rhodium plated articles defy the effects of marine and industrial atmospheres. Long used for electroplating jewelry and for searchlight and moving picture projector mirrors, the restrictions placed upon other plating metals have inspired its use for plating optical mounts, contacts for communications equipment, radar components, pen and pencil sets and myriad other applications.

Rhodium Plating

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Let us send you
"Directions for Rhodium Plating."

sion of the core material. Porcelain enameled aluminum will also stand a mild degree of forming in the field.

GEORGE KOCH SONS, INC., of Evansville, Ind., has been awarded a subcontract for sheet metal construction work on the Atomic Energy Commission's new gaseous diffusion plant being built near Portsmouth, Ohio.

Work under the subcontract includes the installation of all sheet metal and allied work on the project, such as heat and ventilation systems, process and pipe enclosures, and other work of a like nature. The work will take approximately four years to complete.

To stimulate interest in the plating industry the Belke Scholarships are offered to capable young men who are interested in the profession.

Two full-tuition, five-year scholarships for the Northwestern University Technological Institute have again been granted by **BELKE MANUFACTURING COMPANY** for students entering this fall.

The University's cooperative program alternates college work with actual work periods in industry over a five-year program for the degree of Bachelor of Science in Engineering.

The Belke Scholarships cover tuition for the five-year period. The student receives the prevailing wage scale for the industrial work periods, which enable him to be very nearly self-supporting.

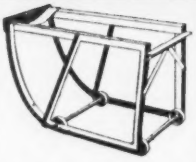
Upon enrollment, students attend college one and one-half years, then alternate between twelve-week periods in industry and twelve-week periods in college.

The periods in industry include work at the Belke plant, at other plants that manufacture plating equipment and in the plating departments of manufacturers, as well as job plating shops.

Admission requirements of the Northwestern University Technological Institute include average high school grades in the upper quarter of the class, with three and one-half units of high school mathematics.

Further information will be supplied promptly on request to Raymond W. Kotz, Belke Manufacturing Company, 947 N. Cicero Ave., Chicago 51, Illinois.

America's Largest Line of { DRUM AND BARREL HANDLING EQUIPMENT FOR QUALITY, PRICE & SERVICE



No. 40 $15.90

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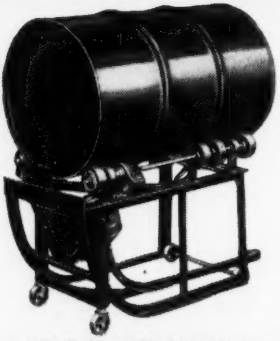

MODEL No. 500 PORTABLE DRUM ROTATOR

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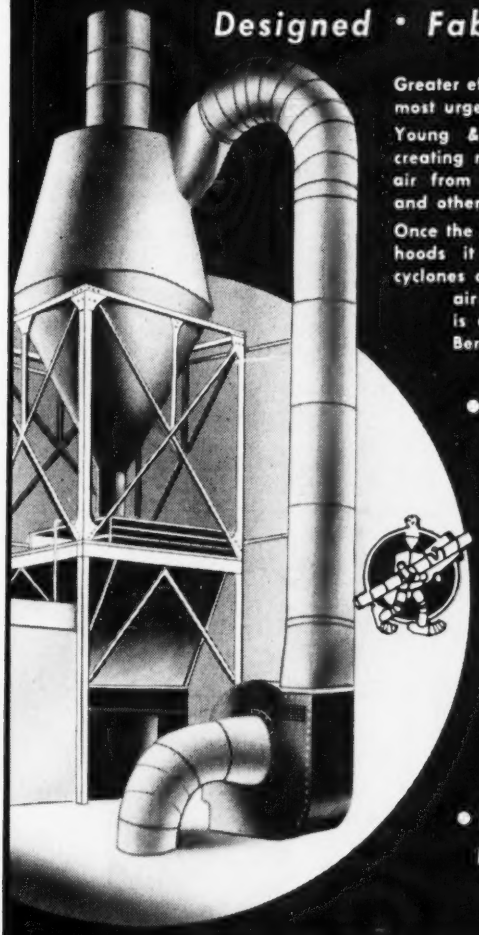
No. 10 $20.70

MORSE *MANUFACTURING CO.* **INC.** 762 West Manlius St. East Syracuse, N. Y.

DUST AND FUME CONTROL
FOR YOUR INDUSTRY
Designed • Fabricated • Installed



Greater efficiency per worker is one of industry's most urgent production needs.

Young & Bertke Dust Collectors over dust-creating machines capture and clean dust-laden air from grinding, polishing, woodworking and other dust-creating machines.

Once the dust is gobbled up by specially placed hoods it is mechanically exhausted to the cyclones outside. A continuous supply of clean air to protect the health of your workers is assured when you install a Young & Bertke Dust and Fume Control System.

- BETTER UTILIZATION OF FLOOR SPACE
- REDUCE FIRE HAZARDS
- LOWER ABSENTEEISM
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- IMPROVE WORKING CONDITIONS
- LENGTHEN THE LIFE OF MACHINERY AND EQUIPMENT

LET US MODERNIZE YOUR PRESENT SYSTEM

The YOUNG & BERTKE Co.

DUST and FUME CONTROL • OVENS • SPRAY BOOTHS

2291 BUCK ST. • CINCINNATI (14), OHIO

Establishment of five scholarships at four colleges and one university has been announced by Arthur W. Steudel, president of **THE SHERWIN-WILLIAMS CO.** The scholarships, each in the amount of $500 annually, are intended to foster the study of chemistry and chemical engineering as professions, and to reward academic excellence at the undergraduate level.

Schools at which the scholarships will be awarded annually are: Illinois Institute of Technology, Chicago, Ill.; Mississippi State College, State College, Miss.; DePauw University, Greencastle, Ind.; Earlham College, Richmond, Ind.; and Lawrence College, Appleton, Wis. Students who have completed three years of college work in chemistry are eligible for the awards.

The George A. Martin Scholarship in chemical engineering has been established at the Illinois school in honor of George A. Martin, late president of Sherwin-Williams. The Mississippi State scholarship will be known as the William A. Hand Scholarship in chemistry, in honor of the late William A. Hand who served for many years as professor of chemistry there and as state chemist for Mississippi.

The other three scholarships have been designated as Sherwin-Williams Scholarships in Chemistry. Award of scholarships at each school will be determined by the Scholarship and Financial Aid Committee and chemistry department.

NEW POSITIONS

A. W. Chandeysson, president of the Chandeysson Electric Company, St. Louis, Mo. has announced the election of **J. F. CARLAND** as executive vice president and general manager of the Company. Mr. Carland, a graduate electrical engineer, spent twenty-three years with the General Electric Company in the manufacturing, engineering, financial and marketing departments of two operating divisions.

Other officers elected recently were **T. A. LEONHARDT,** vice president and plant superintendent, and **WILLIAM E. SCHWARZ,** vice president and engineering and plant manager. Mr. Leonhardt has been associated with the Company for 30 years in several management capacities and Mr. Schwarz, formerly chief

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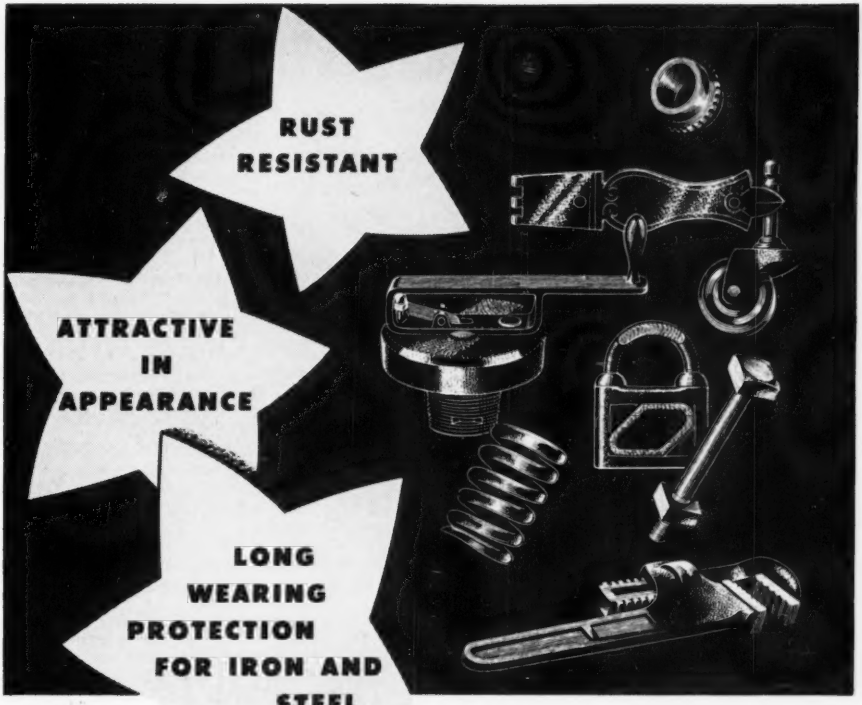

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Parco Compound, constantly improved over the past third of a century, now offers greatest efficiency and economy in the protection of iron and steel against rust and corrosion.

In addition to rust resistance, Parco Compound adds greatly to the attractive appearance of the treated parts. When it is combined with stains or oils, a very dark satin finish is produced. Treated metal may be waxed, or may be painted with excellent results.

While efficiency and flexibility has increased, cost is still extremely low. Treatment with Parco Compound is quick, simple, uniform, completely dependable. The only limitation on size of parts treated is the size of the processing tanks.

Parco Compound meets government specifications for military use, and is replacing cadmium and zinc in many civilian applications.

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PARKER RUST PROOF COMPANY
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BONDERITE—corrosion resistant paint base • **BONDERITE and BONDERLUBE**—aids in cold forming of metals • **PARCO COMPOUND**—rust resistant • **PARCO LUBRITE**—wear resistant for friction surfaces

(Left to right) J. F. Carland, D. Bundschuh, W. E. Schwarz

engineer, rejoined the Company and brings valued experience from his work with Westinghouse Elec. & Mfg. Co., and Du Pont. **D. BUNDSCHUH,** treasurer and office manager and **K. H. EGGERS,** secretary were re-elected officers.

Chandeysson Electric Company, well known in Metal Industry circles for 49 years, is a St. Louis electrical manufacturer of heavy duty motor-generator sets that supply low voltage current for electroplating, electroforming of metals, electrocleaning, and aluminum anodizing in industries such as aviation, automotive, appliances, silverware, hardware.

In a move made necessary by a recent expansion program, Udylite Corporation announced that **L. K. LINDAHL** was relinquishing his duties as president to devote full time as chairman of the board, and that **CLYDE H. REEME** would assume the presidency.

In other Udylite shifts, Lindahl announced the appointment of **LAWRENCE V. NAGLE** as executive vice-president and **ARTHUR L. BARAK** as treasurer.

Mr. Reeme, born in Tiffin, Ohio, has been with Udylite since 1927 when he joined the firm as auditor. He was named

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- ★ Especially adapted to low-cost clarification work

NOTE: When Iso-Fil No. 1 is used, the filter is "set" by using only ½ oz. of material for each square foot of filter surface, rather than the usual 4 oz. per square foot recommended when using diatomaceous earth. Usually no addition of filter material is required on the run.

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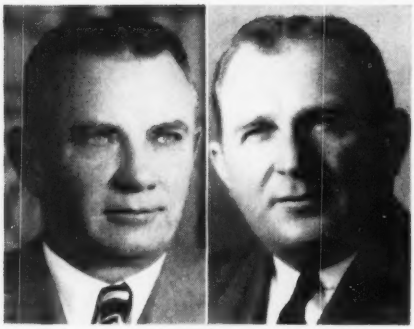

L. K. Lindahl (left), Lawrence V. Nagle

Arthur L. Barak (left), Clyde H. Reeme

assistant treasurer in 1929. He became vice-president and treasurer in 1938 and has served in that capacity up to his recent appointment.

Mr. Nagle formerly was vice-president and general sales manager. He has been with Udylite since 1927, coming from the United Autographic Register Company.

Mr. Barak, a native of Boston, Mass., joined Udylite Corporation in 1935. He succeeded Reeme as assistant treasurer in 1938. Barak was with Federal Motor Truck Company before his association with Udylite.

Udylite Corporation is one of the nation's leading manufacturers of industrial metal finishing and plating materials and equipment.

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Sands, Rubs, Polishes ... for Dry or Wet Finishing
Powerful, direct-connected (no gears), 3450 r.p.m., 100-120 v AC air-cooled motor. All sealed ball-bearing construction. Die-cast aluminum housing, polished. All-position handles. In hand weight only 5 lbs. Insulated with ground wire for wet as well as dry sanding or rubbing. Available accessories—deep contour pads, surface plates, felts, etc. Takes any sheet abrasives—3 covers 4½" x 6½" from standard 9" x 11" sheet.
A time saving quality tool priced so every worker can have one.
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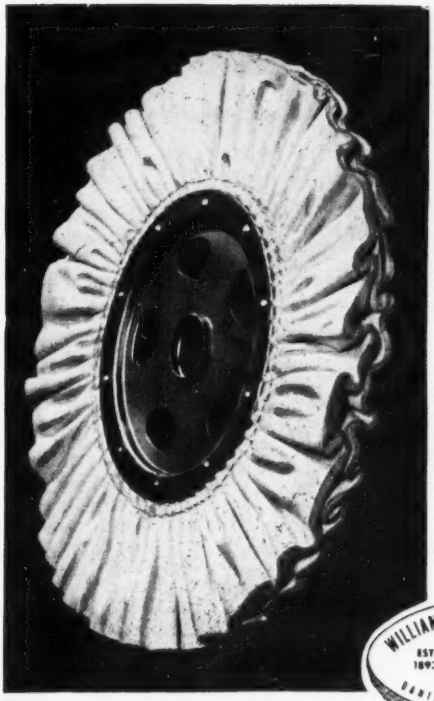

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Steel center is perforated for cool running
Engineered throughout for perfect balance

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the new CUTMASTER can cut your automatic
buffing cost now—write, wire or phone!

WILLIAMSVILLE BUFF DIVISION
The Bullard Clark Company
DANIELSON, CONNECTICUT

Subsidiary companies wholly-owned by Udylite are the Frederick B. Stevens Company with headquarters in Detroit and important plants and offices in Springfield, Ohio, (Mitchell Manufacturing Division) Indianapolis, Buffalo and New Haven; Frederick B. Stevens of Canada, Limited, with plants and offices in Toronto and Windsor; L. H. Butcher and Company of Los Angeles, west-coast producer and distributor of metal finishing and plating compounds and Parker-Wolverine Division, Detroit.

G. S. Blakeslee & Co., manufacturer of degreasing machines and pump-type alkali washers, has added **HENRY KASHMAN** as sales engineer. Mr. Kashman will handle the New York City and Long Island territory.

Mr. Kashman's background involves considerable technical and sales experience. He served in both the Quartermaster Corps and the Corps of Engineers, holding the rank of Captain. His army experience helped to broaden and deepen his familiarity with industrial chemicals and cleaning equipment. He will operate out of the New York office.

Henry Kashman (left), Wilbur Thiess

WILBUR THIESS has joined G. S. Blakeslee & Co. as sales engineer. He brings to Blakeslee a wealth of experience in selling the type of equipment and products handled by this manufacturer. His territory will be the southern half of Ohio and portions of Kentucky and West Virginia.

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Polishing and Buffing

All Metals

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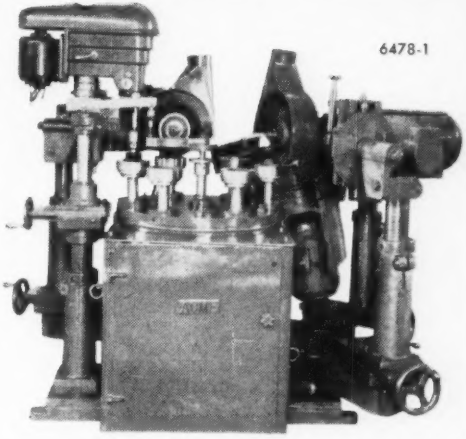
ACME *Rotaries* CUT FINISHING COSTS!

The photograph at right shows an ACME 30-inch six-station Indexing Rotary with three standard ACME type G-3 polishing and buffing lathes and one special drill head. Used for wire brushing ID, OD and top surface of electric motor rotors simultaneously. ACME Rotary Automatic Polishing and Buffing Machines are available in Indexing or Continuous types with tables from 18" to 10' diameter.



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ON REQUEST

Meet Production Schedules with ACME *Automatics!*

Acme Automatic Polishing and Buffing Machines provide a dependable solution to the problem of maintaining high civilian or defense production schedules at minimum unit costs. These highly efficient machines are available in types to handle parts of virtually any size or shape, with a wide variety of arrangements and accessory equipment to meet the specific finishing requirements. Problems of polishing, buffing, grinding, wire brushing, de-burring and Micro-finishing are effectively solved by Acme Automatics.

For recommendations, send blue prints of part or samples before and after finishing operations, with detailed information on finishing operations and production requirements. If production methods will cut your costs, we can set your job up in our experimental department and you can inspect it in operation.

ROTARY
STRAIGHT LINE
SEMI-AUTOMATIC
AND SPECIAL
Polishing and Buffing
Machinery

SPECIAL MACHINERY
AUTOMATIC BUFFING MACHINES

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OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR NEARLY HALF A CENTURY

At the Annual Meeting of the Boston Branch, A.E.S., held on April 18, A. E. Carlson (above, left) General Chemical Division of Allied Chemical and Dye Corp., spoke on "Plating from Fluoborate Solutions." Dr. Walter R. Meyer, (above, center) Enthone, Inc., spoke on "Adhesion of Electrodeposits and New Methods of Cleaning and Oxide Removal." In the photo above Dr. Meyer is shown demonstrating the Enthone Alkaline Derusting Process. Raymond Stricklen, (above, right) Allied Research Products, Inc., presented a paper on the subject of "Chromate Coatings," showing how chromate conversion coatings increase corrosion resistance and service life of metal products.

JOHN E. MANNING has been appointed western district manager for Promat Division, Poor & Company, Waukegan Illinois, supplier of electroplating chemi-

Fig. 1—(Below—top) The recent Annual Meeting of the Milwaukee Branch, A.E.S., held on April 25, attracted 80 members and guests to the plant visitation program, more than 100 for the luncheon, approximately 200 for the Educational Session and 600 for the Banquet. Committee members stated that the 1953 meeting was the best ever for the Milwaukee Branch.

The Speakers Table at the Milwaukee Branch Annual Luncheon. Shown (left to right) are: Phil J. Ritzenthaler, Branch President Kenneth Olsen, Dexter Rhoades, A.E.S. 3rd Vice President Clyde Kelly, Dr. R. B. Saltonstall, Dr. Abner Brenner, R. Scott Modjeska, Wm. Geissman, Leslie Dively, chairman of the Annual Meeting.

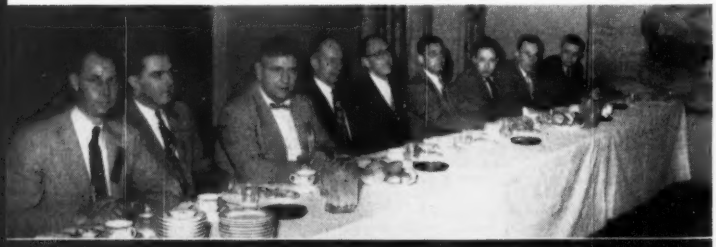

Fig. 2—Vincent Matticotti presided during the question-and-answer period that followed the educational program. Shown (left to right) are: R. Scott Modjeska, Dr. Abner Brenner, Dr. R. B. Saltonstall, and Mr. Matticotti.

Fig. 3 — An informal group photographed at the educational session. Shown (left to right) are: Ezra A. Blount, editor of PRODUCTS FINISHING, Leslie Dively, Sy Bivins, educational chairman for the meeting, Kenneth Olsen, Henry Bornitzke, plant visitation chairman, and Marion Longfield, Chicago Branch, co-chairman of the 1952 Convention Committee.

(PRODUCTS FINISHING Staff Photos)

cals and processes. He was formerly employed by the Sundmark Supply Company, Los Angeles, and the Wolverine Brass Works, Grand Rapids, Michigan, as a process engineer. Mr. Manning received his degree in Chemical Engineering from Michigan State College.

NECROLOGY

STEWART A. MILLAR, new products development engineer for the Detrex Corp. of Detroit, major manufacturer of industrial cleaning equipment and chemicals, passed away recently at the age of 27.

Regarded as one of the most brilliant members of the Detrex engineering staff, young Millar was a key man in the development of ultrasonic metal cleaning equipment, recently announced by the company. He was stricken fatally, shortly after returning from the West Coast where he had demonstrated ultrasonics at the Western Metal Show in Los Angeles and also before a meeting of the Electroplaters' Society.

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Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8078 Military Ave., Detroit 4, Mich.

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Will greet you there in person.

BILL CHACE.

Agate Lacquer Mfg. Co., Inc.

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AGATEEN

THE LAST WORD IN QUALITY

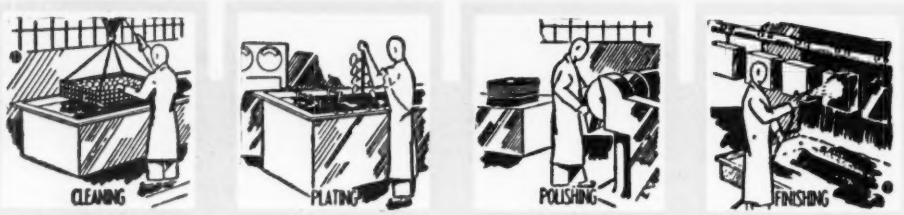
Jun. 15-18. American Electroplaters' Society, 40th Annual Convention, Benjamin Franklin Hotel, Philadelphia, Pa.

June 29-July 3. ASTM Annual Meeting, Chalfonte-Haddon Hall, Alantic City, N. J.

Sept. 16-18. 15th Annual Shop Practice Forum, Porcelain Enamel Institute, Ohio State Univ. and Deshler-Wallick Hotel, Columbus, Ohio.

Sept. 23-25. 56th Annual Convention of the International Association of Electrotypers & Stereotypers, Hotel Statler, Detroit, Mich.

Oct. 29-31. 31st Annual Meeting of the Federation of Paint and Varnish Production Clubs, Chalfonte-Haddon Hall, Atlantic City, N. J.



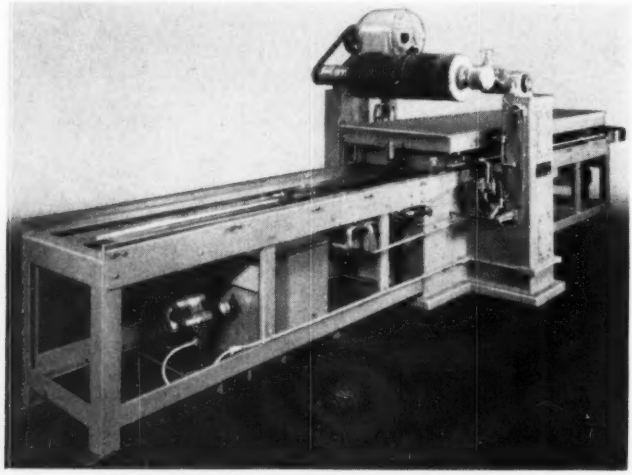
New • EQUIPMENT • MATERIALS • PROCESSES

Series H-M 84 Horizontal Polishing Machine

Designed specifically for polishing long lengths of metal extrusions, rods, sheets, and similar forms, a horizontal, mechanical polishing machine has been announced by Central Machine Works, 72 Commercial St., Worcester, Mass.

The polishing machine consists of a hydraulically operated and controlled work table which is made to oscillate beneath one or two motor driven polishing and buffing rolls. The frame and bed of the machine are of welded steel construction. General specifications for the Series H-M horizontal polishing machines are as follows:

Principal Construction—All welded steel.
Width of Machine (Standard)—5 ft. 5 inches.
Height of Machine (Standard)—5 ft. 8 inches.
Length (Depending on stroke)—16 ft. to 43 feet.
To obtain the total length of any H-M. Machine, multiply the stroke of the machine in feet by two and add 1½ ft. to this sum.
Roll Motor—10 h.p.
Rolls 30 inches long, 10 inches diameter (Standard).
Width of Work Table—31 inches.
Length of Work Table—1 ft. longer than machine stroke.
Stroke of all machines variable from 2 inches to full stroke.
Stroke smaller than 2 inches may be obtained by proper camming of any of the above models.



Series H-M 84 Horizontal Polishing Machine

Hydraulic Motor—1 h.p.
Weight of a 7 foot stroke machine—3200 pounds.

The manufacturer points out that the machine is designed to polish the entire length of extrusions, sheets, and similar shapes through the use of simple fixtures. The machine can also polish small parts where several different surfaces must be finished.

The machine is adjustable so that a greater polishing effort can be expended on certain portions of the work. Further, the work can be made to oscillate across the face of the polishing or buffing roll.

With a work table width of 30 inches, the horizontal polishing machines are furnished in standard sizes to take work from six foot lengths to 20 foot lengths. The polishing stroke is adjustable by stepless increments from two inches to full stroke.

Thompson Anti-Spatter

Thompson & Company, Oakmont, Pa., has announced development of an anti-spatter compound to increase speed and efficiency of welding operations by reducing necessary clean-up time. Designated as Thompson Anti-Spatter, the compound is brushed, sprayed or wiped along the edges to be welded and over an area extending six to eight inches from the weld. When the hot spatter from the welding operation strikes the compound it will not adhere to the metal and thus can be easily wiped off without grinding or brushing. Ordinarily, this spatter would fuse to the metal and be difficult to remove.

There are two types of Thompson Anti-Spatter: No-Clean (SO-327) which provides a firm foundation for paint and requires no removal before priming; and Pickle-Off (SO-317) for use where the job is to be pickled and for use on chromium or stainless steel where ease of removal is a desirable feature.

Anti-Spatter may be used in all kinds

BAR-L* VAPOR DEGREASER

Economical Trouble-Free Parts Cleaning!

* Patent Pending

Bar-L Vapor Degreaser cleans all metal parts, removes sludge, grease, dirt in seconds! And your parts come out warm and dry.

So designed that the heating element is in no danger of damage from dropped parts or insulated by settled residues, Bar-L Degreaser cleans anything that will fit into the solvent drum!

Economy of operation is assured by a record of trouble-free service. Almost 100% recovery of the solvent is made possible by the design of the condenser which returns the solvent to the boiling chamber. Continuous, high production is a fact with Bar-L!

If your requirements indicate tanks larger than the standard 55 gallon drum, several units may be used together in larger tanks.

Literature on standard degreasers and information on custom machinery is yours for the asking.

Write or wire today!

Manufacturers Processing Co.
METAL CLEANING CHEMICALS AND EQUIPMENT
1360 HILTON ROAD DETROIT 20, MICHIGAN

of weather. It causes no glare and has no disagreeable odor either when being applied or when being burned. If it gets on the surface of the weld it does not interfere with solidity or strength.

H-VW-M Selenium Rectifier

An improved selenium rectifier has been developed by Hanson-Van Winkle-Munning Co., Matawan, N. J., for the electroplating industry. The new rectifier, which sells at a popular price, has a combination of features that have never before been offered in a single commercial rectifier used in electroplating operations, the manufacturer states.

The H-VW-M rectifier delivers a full wave, single-phase current with a theoretical ripple of 4.5 per cent. AC input is dual—110/440 volt, three phase, 60 cycle. H-VW-M guarantees continuous operation at full capacity, 24 hours a day, for a full year.

The rectifier comes in both self-contained and remote control models. The self-contained model houses all the equipment and electrical devices that make up the complete rectifier unit—selenium stacks, transformers, cooling fan, magnetic devices, protective mechanisms, starter, meters and voltage control mechanisms. Size of the 12/24-volt (1500/750 amp.), self-contained unit is 24 inches wide, 26 inches deep and 65 inches high.

The remote control model is built in two units. One unit contains the controls; it houses the starter, meters and voltage control mechanism. The other unit houses the other rectifier equipment. The control unit, which may be located anywhere in the plant, handles as many basic rectifier units as are needed in any single electroplating operation.

Chief design features:

1. A 12-14 gauge steel cabinet that houses the electrical equipment. The all-welded cabinet, which is designed for heavy-duty service, is built on substantial iron frames, and mounted on rubber shocks.

2. A fan, which draws air through the cabinet to cool the transformers and selenium stacks, is run by a totally inclosed motor that has sealed lubrication.

3. Glass wool dust blocks. These treated blocks filter incoming air, remove all solids and a large portion of fumes.

4. Control and power transformers that are calculated on the basis of convection cooling. These transformers, which step down the voltage of the alternating current going into the selenium stacks, continually operate at temperatures up to 25 deg. C. above ambient.

5. A single-knob control switch. This type of switch, which is used on all intermediate ratings, prevents unbalancing of phases. The switch, which has 22 positions, covers the entire voltage range, or any part of it.

6. Standard-make motor starter — rather than a starting contactor. The motor starter will provide overload protection on the a.c. side, as well as low-voltage release.

7. Heavily coated selenium stacks. These stacks, which rectify low-voltage alternating current to low-voltage direct current, are dipped for cor-

H-VW-M Selenium Rectifier.

rosion resistance and fungus proofing. They are balanced and assembled by Hanson-Van Winkle-Munning.

Oakite CrysCoat HC

Oakite CrysCoat HC is described by the manufacturer, Oakite Products, 19 Rector St., New York 6, N. Y., as a phosphatizing material which creates a complex zinc phosphate coating on steel and iron. It is stated to provide a coating which is crystalline in nature and with a weight ranging from 200 to 1000 milligrams per square foot, depending upon how it is applied and the type of steel being treated. It may be used in tanks and in pressure spray washing machines and with both methods the following Government Specifications are fully met: JAN-C-490, Grade I; 57-O-2C, Type 2, Class C; and PA-PD-191 Rev. A. The salt spray resistance of painted parts treated with Oakite CrysCoat HC exceeds the requirements of these Government Specifications, it is claimed.

Oakite CrysCoat HC is furnished in liquid form and is added to water to make the processing solution. Sludging and scaling are reduced to an absolute minimum and the material need not be used in stainless steel tanks. Steel coils should be of an acid-resistant material, however. In washing machines, the nozzles, risers and the pump impeller should be fabricated of an acid-resistant material.

When using Oakite CrysCoat HC in tanks a five tank procedure is recommended as follows:

1. To remove grease, oil, and shop dirt of an average type, charge the first tank with Oakite Composition No. 63 or other recommended Oakite materials at 4 to 6 ounces per gallon at a temperature of 180-200 deg. F. for five minutes. For heavy soil, use Oakite Composition No. 19 or Oakite Composition No. 24 at 8 ounces per gallon at 200 deg. F. for five minutes.

On any metal finishing problem

DEPEND on DU-LITE TO CUT COSTS

Courtesy Artistic Wire Products Co.

For instance ...

Graphitic compound, grease and oil made these wire dish strainers tough to prepare for plating. Upon using Du-Lite's #31 Cleaner, the strainers were thoroughly cleaned, and surfaces prepared for plating, with a saving of 1000 lbs. of cleaning compound per month.

What's YOUR problem?

Du-Lite's service to industry is complete from research on specific metal finishing problems to installation of processing equipment. Du-Lite's line includes cleaners, strippers, blacking agents, wetting agents, passivating agents, rust preventatives, burnishing compounds etc. for any type of metal.

See your nearest Du-Lite Field Engineer or write for more information.

Du-Lite DU-LITE CHEMICAL CORP. MIDDLETOWN • CONN.

METAL FINISHING SPECIALISTS

Eastern Felt

WHEELS, BUFFS & BOBS

IN MANY SHAPES
and
10 DENSITIES
FOR YOUR FINISHING
NEEDS

A Extra Soft—for polishing tin, glass, and instrument hands
B Soft—for polishing aluminum, jewelry, soft brass; used as a coloring wheel
C Medium—for general work, polishing copper, brass, bronze, jewelry, hardware
D Hard—for polishing cut stones, hardware, ornamental ironware
E Rock Hard—for polishing steels, plastics, leather

Also made in A+, extra soft+
B+, soft+
C+, medium+
D+, hard+
E+, rock hard+

LET US HELP YOU WITH
YOUR BUFFING PROBLEMS

Eastern Felt Co.
WINCHESTER • MASS.

2. Hot rinse at 160 deg. F. for one to three minutes.
3. Charge the tank with Oakite CrysCoat HC at 1½ to 2½ per cent by volume—temperature ranging from 180 to 210 deg. F.—time three to five minutes depending upon the weight of coating desired.
4. Cold overflowing rinse.
5. Final rinse—charge with $\frac{1}{16}$ ounce per gallon of chromic acid—temperature 160 deg. F.—time 30 seconds to one minute.

For use in pressure spray washing machines a five stage sequence is recommended as follows:

1. Charge with Oakite Composition No. 63 or other recommended Oakite material at 1 to 2 ounces per gallon—temperature 180-200 deg. F.
2. Hot rinse at about 160 deg. F.
3. Oakite CrysCoat HC at ¾ to 1½ per cent by volume—temperature 160-200 deg. F.
4. Overflowing rinse.
5. Final rinse consisting of a solution of chromic acid at $\frac{1}{16}$ ounce per gallon—temperature 160 to 180 deg. F.

In tanks, an immersion of at least three minutes in the CrysCoat HC solution is recommended and a coating ranging from 600 to 900 milligrams per square foot will be obtained in that period of time, depending upon the type of steel. In washing machines, one minute in the Oakite CrysCoat HC stage will create a coating ranging from 200 to 300 milligrams per square foot. Longer exposure will increase the weight of coating.

THE FLOWING OF ELECTRODEPOSITED TIN is the subject of **DATA SHEET NUMBER** 120 available from **Metal & Thermit Corp.**, 100 E. 42nd St., New York 17, N. Y. The entire process, equipment and solutions are described. Common difficulties and their correction are also discussed.

ULTRASONIC GENERATOR. CATALOG SHEET GEC-544A describing the ultrasonic generator is available from **General Electric Co., Special Products Division**, Schenectady, New York. Features of the ultrasonic generator, a description of its operation, and specifications as well as examples of applications for ultrasonic energy are included in the bulletin.

One application for the ultrasonic generator is as a power source for ultrasonic cleaning with chlorinated solvents.

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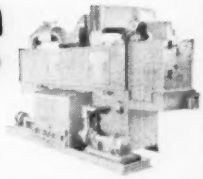

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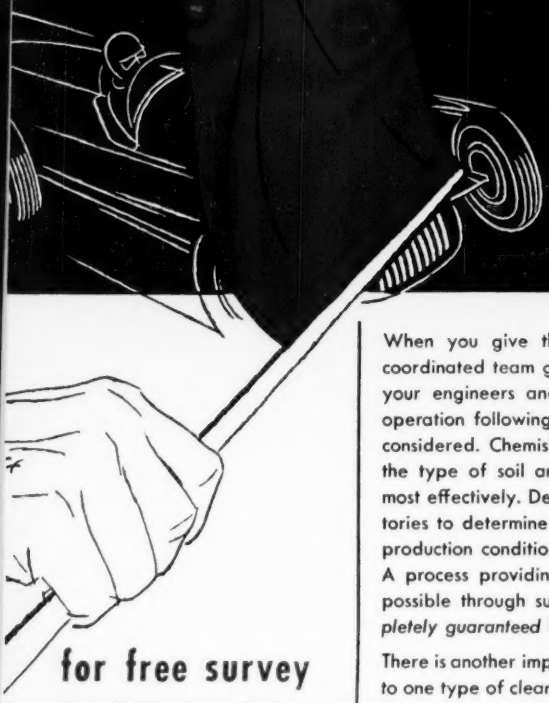

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